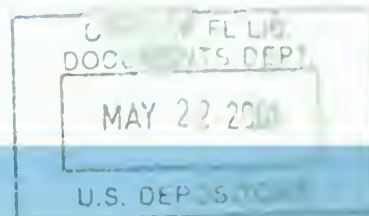


UNITED STATES NAVAL ACADEMY
ANNAPOLIS, MARYLAND



HONOR . . . COURAGE . . . COMMITMENT

LEADERS FOR AMERICA

Profile

The school	Founded as the Naval School in 1845, the United States Naval Academy today is a four-year service academy that prepares midshipmen morally, mentally and physically to be professional officers in the naval service.
Location	The academy is set on 338 acres between the south bank of the Severn River and historic downtown Annapolis, the state capital of Maryland. Annapolis is 33 miles east of Washington, D.C., and 30 miles southeast of Baltimore.
Campus	The Yard, as the campus is called, features tree-lined brick walks, French Renaissance and contemporary architecture and scenic vistas of the Chesapeake Bay. The Bancroft Hall dormitory complex, the Cathedral of the Navy, and other 90-year-old buildings make the academy a National Historic Site. New facilities, such as the multi-purpose Alumni Hall, Nimitz Library with more than half a million volumes, Rickover Hall engineering complex and Hendrix Oceanography Laboratory, give the academy state-of-the-art educational resources.
Students	About 4,000 men and women represent every state in the U.S. and several foreign countries.
Faculty	The 600-member Naval Academy faculty is an integrated group of military and civilian instructors in approximately equal numbers. The student-faculty ratio is 7:1, with most class sizes ranging from 10 to 22 students.
Academics	In addition to a core curriculum of academic and professional courses, majors are offered in 18 subject areas: seven in engineering; seven in science, mathematics and computer science; and four in the humanities and social sciences.
Professional Training	Midshipmen study subjects such as small arms, drill, seamanship and navigation, tactics, naval engineering, naval weapons, leadership, ethics and military law during the four-year program. In addition, midshipmen train at naval bases and on ships in the fleet during part of each summer.
Athletics	Midshipmen can choose from 21 men's and nine women's intercollegiate varsity sports, 11 intramural sports and 14 club sports.
Extracurricular Activities	More than 100 extracurricular activities are offered in areas ranging from music and drama to parachuting and scuba diving.
Graduation	Bachelor of science degrees specifying a major field are awarded to midshipmen upon graduation in May. They receive reserve commissions as ensigns in the U.S. Navy or second lieutenants in the U.S. Marine Corps and serve at least five years of exciting and rewarding service as officers.

For more information, call the Admissions Office: (410) 293-4361

or write:

Admissions Office
United States Naval Academy
117 Decatur Road
Annapolis, Md. 21402-5018

or reach us by Internet on the Worldwide Web: www.usna.edu

UNITED STATES NAVAL ACADEMY

2001-2002 CATALOG

**THE U. S. NAVAL ACADEMY
PRODUCES MORE ASTRONAUTS
THAN ANY OTHER UNIVERSITY
IN THE COUNTRY.**

A full-page photograph of an astronaut in a white spacesuit floating in space. The astronaut is wearing a helmet with a reflective visor and has a NASA logo on the chest. The Earth's blue and white cloud-covered surface is visible in the background.

**BRUCE McCANDLESS II
CLASS OF '58**

ANNAPOLIS, MARYLAND







Dear Prospective Candidate:

Congratulations on your interest in the United States Naval Academy. Since 1845, more than 67,000 young men and women have successfully completed “four years by the Bay” to take their well-deserved places in America’s naval service. Many Naval Academy graduates have achieved greatness and earned a special place in our nation’s history during its struggle to grow and preserve its freedom. Their names resonate: Dewey, Halsey, King, Lejeune, Nimitz, Rickover, Spruance, Burke, Stockdale, Carter . . . Their journeys began here in beautiful Annapolis. And every summer, new journeys begin at the Academy for 1,200 young people from all fifty states.

Here at the Naval Academy, unique and talented individuals embark on a very special mission to become future leaders of this nation—men and women of great character, competence, vision and drive. This distinguishes the Naval Academy from other academic institutions, but achieving this goal does not come easily. We challenge midshipmen to stretch for excellence by reaching beyond their perceived capabilities.

As midshipmen, you will complete a unique four-year immersion program that provides you with a superb education, inside and outside the classroom—in Bancroft Hall, on athletic fields and aboard sailboats and yard patrol craft. Additionally, our summer training program will provide you with overseas cruise opportunities and a chance to familiarize yourself with Navy aircraft, ships and submarines, as well as Marine Corps units.

We also place great emphasis on character development in all aspects of your education. The Academy offers an incomparable opportunity where young men and women—from a diversity of races, regions, socio-economic groups and religions—gather in a special environment to learn and practice strong values and ideals. The result of this comprehensive process is a collective group of young leaders more morally, mentally, and physically sound than could be developed in any other environment. The leadership skills you cultivate at Annapolis will serve you for a lifetime and enable you to excel when you reach your initial assignment in the Navy or Marine Corps.

Upon graduation and commissioning as a Navy ensign or a Marine Corps second lieutenant, you will have the opportunity to lead some of America’s finest young men and women and serve your nation in a wonderfully challenging and rewarding assignment.

The Naval Academy has much to offer young men and women looking for success and a bright future. If this sounds like something you’re interested in learning more about, then I encourage you to continue reading. The Naval Academy might be just the place for you. Good luck in deciding your future. We look forward to answering any questions you might have.



Sincerely,

J. R. RYAN
Vice Admiral, U. S. Navy
Superintendent

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Midshipmen are persons of integrity: *They stand for that which is right.*

- They tell the truth and ensure that the truth is known. *They do not lie.*
- They embrace fairness in all actions. They ensure that work submitted as their own is their own, and that assistance received from any source is authorized and properly documented. *They do not cheat.*
- They respect the property of others and ensure that others are able to benefit from the use of their own property. *They do not steal.*

Introduction

United States Naval Academy

As the undergraduate college of the Naval service, the Naval Academy prepares young men and women to become professional officers in the U.S. Navy and Marine Corps. Naval Academy students are midshipmen on active duty in the U.S. Navy. They attend the academy for four years, graduating with bachelor of science degrees and reserve commissions as ensigns in the Navy or second lieutenants in the Marine Corps. Naval Academy graduates serve at least five years as Navy or Marine Corps officers.

Around the Yard

The scenic Naval Academy campus, known as the Yard, is located in historic Annapolis, Md., where the Severn River flows into the Chesapeake Bay. With its combination of early 20th-century and modern buildings, the Naval Academy is a blend of tradition and state-of-the-art technology that exemplifies today's Navy and Marine Corps. Throughout the Yard, tree-shaded monuments commemorate the bravery and heroism that are an inherent part of the academy's heritage. Buildings and walkways are named for Naval Academy graduates who have contributed to naval history and their nation.

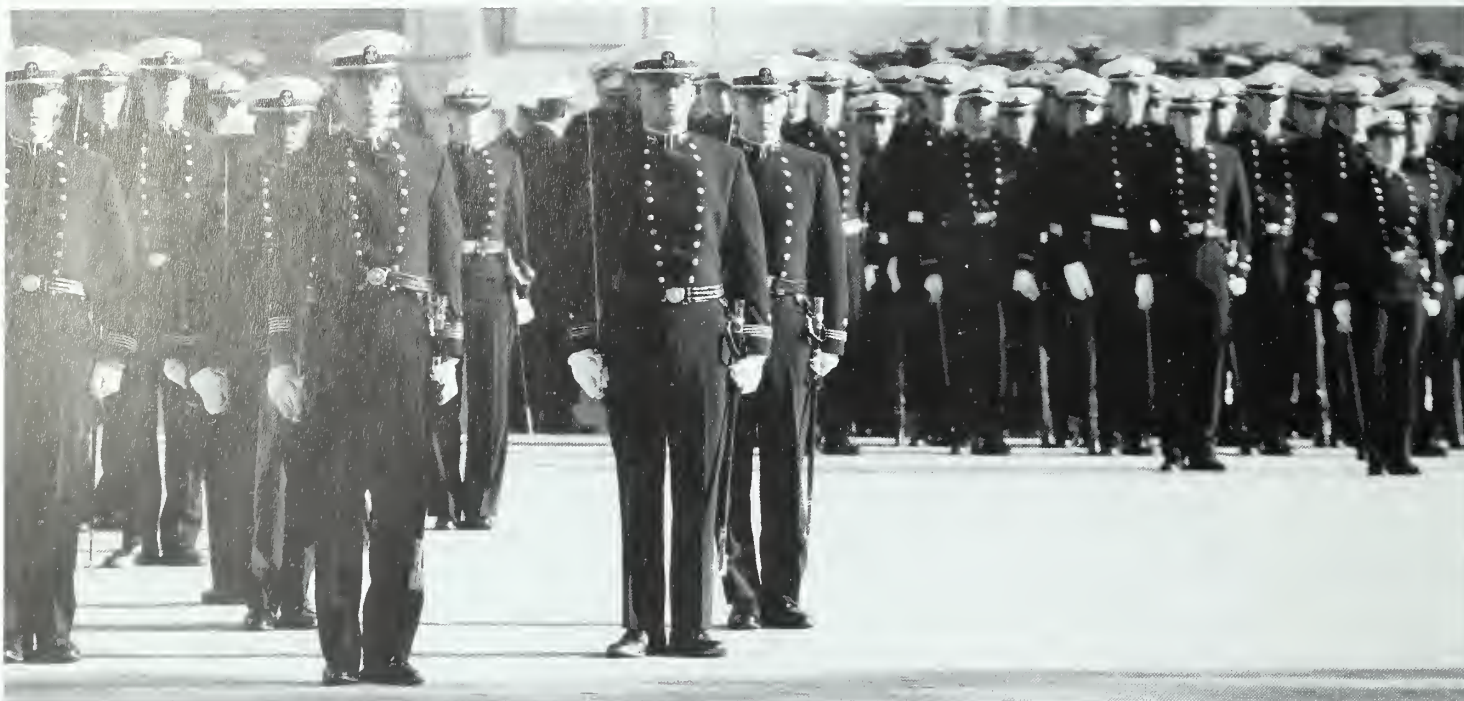
The Naval Academy also is the final resting place of Revolutionary War naval hero John Paul Jones whose words, "I have not yet begun to fight," have inspired generations of U.S. Navy officers. His crypt is located beneath the Academy chapel, also known as the Cathedral of the Navy. A National Historic Site, the Naval Academy hosts about one million tourists every year from all over the United States and around the world. They come to enjoy the natural beauty of the Yard, to recall some of this country's naval history and to marvel at the traditions carried on in midshipmen parades and military formations.

Tourists and midshipmen also appreciate downtown Annapolis, which lies outside the gates of the Academy. With its colonial charm and busy waterfront, Maryland's state capital provides a pleasant, diverse setting for one of America's premier colleges, the United States Naval Academy.

History

Founded in 1845 by Secretary of the Navy George Bancroft, the Academy started as the Naval School on 10 acres of old Fort Severn in Annapolis. Since then, the development of the Naval Academy has reflected the history of the United States. As our country has changed culturally and technologically, so has the Naval Academy. In only a few decades, the Navy has moved from a fleet of sail and steam-powered ships to a high-tech fleet with nuclear-powered submarines and surface ships and supersonic aircraft. The Academy has changed, too, giving midshipmen the up-to-date academic and professional training they need to be effective naval officers in their assignments after graduation.

In 1850 the Naval School became the United States Naval Academy. A new curriculum went into effect requiring midshipmen to study at the Academy for four years and to train aboard ships each summer. That format is the basis of a far more advanced and sophisticated curriculum at the Naval Academy today. As the U.S. Navy grew over the years, the academy expanded. The campus of 10 acres increased to 338. The original student body of 55 midshipmen grew to a brigade of 4,000 midshipmen. Modern granite buildings replaced the old wooden structures of Fort Severn and the Naval School.



Congress authorized the Naval Academy to begin awarding bachelor of science degrees in 1933. The Academy later replaced a fixed curriculum taken by all midshipmen with the present core curriculum plus 18 major fields of study, a wide variety of elective courses and advanced study and research opportunities.

The Naval Academy first accepted women as midshipmen in 1976, when Congress authorized the admission of women to all of the service academies. Women comprise about 15-17 percent of entering plebes—or freshmen—and they pursue the same academic and professional training as do their male classmates.

The Navy of the United States is the right arm of the United States and is emphatically the peacemaker.

—THEODORE ROOSEVELT

Mission

The Naval Academy has a unique clarity of purpose, expressed in our official mission: “To develop midshipmen morally, mentally and physically and to imbue them with the highest ideals of duty, honor and loyalty in order to provide graduates who are dedicated to a career of naval service and have potential for future development in mind and character to assume the highest responsibilities of command, citizenship and government.” This puts everyone—faculty, staff and midshipmen—on the same wavelength. It also encourages a sense of spirit and pride found at few other schools.

Program

The moral, mental and physical elements of our program are equally important, all contributing to the qualities of an outstanding naval officer.

Academics

Every midshipman’s academic program begins with a core curriculum that includes courses in engineering, science, mathematics, humanities and social science. This is designed to give you a broad-based education that will qualify you for practically any career field in the Navy or Marine Corps. At the same time, our majors program gives you the opportunity to develop a particular area of academic interest. For especially capable and highly motivated students, we offer challenging honors programs and opportunities to start work on postgraduate degrees while still at the Academy.



Professional and leadership training

We don't just tell you about life in the Navy and Marine Corps. After four years at the Naval Academy, the life and customs of the naval service become second nature. First, you learn to take orders from practically everyone, but before long, you acquire the responsibility for making decisions that can affect hundreds of other midshipmen. Your professional classroom studies are backed by many hours of practical experience in leadership and naval operations, including assignments with Navy and Marine Corps units during summer months.

Moral education

Moral and ethical development is a fundamental element of all aspects of the Naval Academy experience. As future officers in the Navy or Marine Corps, midshipmen will someday be responsible for the priceless lives of many men and women and multi-million dollar equipment. From Plebe Summer through graduation, the Naval Academy's Character Development Program is a four-year integrated continuum that focuses on the attributes of integrity, honor, and mutual respect. One of the goals of this program is to develop midshipmen who possess a clearer sense of their own moral beliefs and the ability to articulate them. Honor is emphasized through the Honor Concept of the Brigade of Midshipmen—a system which was originally formulated in 1951 and states "Midshipmen are persons of integrity: they stand for that which is right." These Naval Academy "words to live by" are based on the moral values of respect for human dignity, respect for honesty and respect for the property of others. Brigade Honor Committees composed of elected upperclass midshipmen are responsible for education and training in the Honor Concept. Midshipmen found in violation of the Honor Concept by their peers may be separated from the Naval Academy.

Physical training

We teach the importance of being physically fit and prepared for stress because the duties of Navy and Marine Corps officers often require long, strenuous hours in difficult situations. The physical requirements of Plebe Summer training, four years of physical education and year-round athletics also develop pride, teamwork and leadership.

Control of the seas means security. Control of the sea means peace. Control of the seas can mean victory. The United States must control the sea if it is to protect our security.

—PRESIDENT JOHN F. KENNEDY



Profile of Midshipmen

It takes a special kind of young man or woman to handle the Naval Academy’s demanding program, but that doesn’t mean all midshipmen are alike. Midshipmen come from all 50 states, U.S. territories and several foreign countries. They have roots in cities, suburbs, farms and ranches, small towns and military bases. They have talents and hobbies of every kind and personalities that fit every description, and they represent the diverse ethnic and cultural heritages that, together, make the United States a great nation. Some characteristics seem to be common among Naval Academy midshipmen, however. The charts on these pages show you that midshipmen are good students, leaders in their high schools and communities and participants in competitive sports. But other common qualities of midshipmen don’t show up in statistics. The young men and women who choose the Naval Academy are looking for more than a college degree. They like the idea of being challenged mentally, physically and personally. They are people who don’t want to settle for the ordinary, the routine or the easy.

Midshipmen are also patriots. They want to serve their country in a meaningful way—in a profession that helped win this nation’s independence more than 200 years ago. Finally, midshipmen are young people who look to the future. They look forward to the challenging Naval Academy program, as well as the opportunities open to them in the Navy and Marine Corps after graduation.

CLASS OF 2004 PROFILE

Applicants and Nominees

Applicants (includes nominees)	10,296
Number of applicants with an official nomination	4,292
Nominees qualified scholastically, medically and in physical aptitude	1,867
Offers of admission	1,520
Admitted	1,224

Combined Scholastic Assessment Test I (SAT-1) and American College Testing (ACT) Program Scores

Score Range	Verbal	Math
>700 (31-36)	20%	35%
600-699 (26-30)	54%	53%
<600 (<26)	26%	12%

Rank in High School Class

First fifth	76%
Second fifth	18%
Third fifth	5%
Fourth fifth	1%
Fifth fifth	0%

Previous College and Prep School

The Class of 2004 includes 27 percent (335) from college and post-high school preparatory programs which include: 177 from Navy Academy Preparatory School (NAPS) in Newport, R.I. (13 having previously attended college); one from Broadened Opportunity for Officer Selection (BOOST) in Newport; 26 from the Nuclear Power School Program in Goose Creek, S.C. (four having previously attended college); 65 from private preparatory schools (six having previously attended college and 59 from preparatory schools under the sponsorship of the U.S. Naval Academy Foundation, Inc.); and 66 additional students completed at least six months of study at a college or university (14 from colleges under the sponsorship of the U.S. Naval Academy Foundation, Inc.)

Military Background

108 midshipmen previously served as enlisted members of the Navy (80) or Marine Corps (28). This figure includes 27 who entered directly from Fleet Service (16 USN and 11 USMC), one from BOOST, 26 from the Nuclear Power School and 54 from NAPS (37 USN and 17 USMC).

Geographical Distribution

Midshipmen were admitted from every state in the nation. The Class of 2004 also includes eleven international students from the following countries: Bulgaria, Honduras, Jamaica, Korea, Lithuania, Philippines, Romania, Singapore, Taiwan, Thailand, and Turkey.

School Honors and Activities

Student body/council/government president or vice president	11%
Class president or vice president	11%
School club president or vice president	28%
School publication staff	22%
National Honor Society	58%
Varsity athletics	88%
Varsity letter winner	82%
Dramatics, public speaking, debating	86%
Leader of musical group	11%
Eagle Scout/Gold Award	11%
Boys/Girls State or Nation	17%
Reserve Officer Training Program	10%
Sea Cadets	2%

Minorities and Women

The Class of 2004 includes 18% (223) minority midshipmen with ethnic backgrounds as follows: African Americans (72), Hispanic (88), Asian Americans (49) and Native American (14).

The Class of 2004 includes 17% (203) women.

Sons and Daughters of Alumni

The Class of 2004 includes 52 sons and 5 daughters of Naval Academy alumni (4.7 percent of the class).

Geographic Distribution of Midshipmen

Fifty States and the District of Columbia

Alabama	22
Alaska	13
Arizona	63
Arkansas	14
California	401
Colorado	50
Connecticut	59
Delaware	21
District of Columbia	12
Florida	227
Georgia	102
Hawaii	17
Idaho	21
Illinois	144
Indiana	49
Iowa	23
Kansas	41
Kentucky	29
Louisiana	51
Maine	17
Maryland	267
Massachusetts	92
Michigan	71
Minnesota	52
Mississippi	13
Missouri	52
Montana	09
Nebraska	18
Nevada	25
New Hampshire	30
New Jersey	172
New Mexico	30

New York	256
North Carolina	97
North Dakota	11
Ohio	136
Oklahoma	33
Oregon	28
Pennsylvania	293
Rhode Island	65
South Carolina	77
South Dakota	12
Tennessee	60
Texas	336
Utah	19
Vermont	8
Virginia	264
Washington	66
West Virginia	22
Wisconsin	65
Wyoming	14

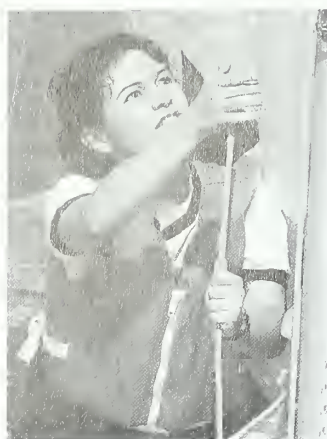
U.S. Territories

Guam	3
Puerto Rico	8
Virgin Islands	3

Foreign Countries

The Brigade includes 32 midshipmen from 19 foreign nations.





*Do your duty in all things.
You cannot do more.
You should never
wish to do less.*

—ROBERT E. LEE

Our Commitment

Setting apart the Naval Academy from almost every other college and university in the country is our commitment to the total development of our students. Some other colleges offer more majors in academics. Some put more emphasis on intercollegiate athletics. But nowhere else do you have a better opportunity to grow intellectually, personally and physically than at the Naval Academy. If you are chosen to enter the Naval Academy, we believe you can complete this tough, four-year program. In fact, we are committed to the principle of helping every midshipman succeed. We back up that commitment with . . .

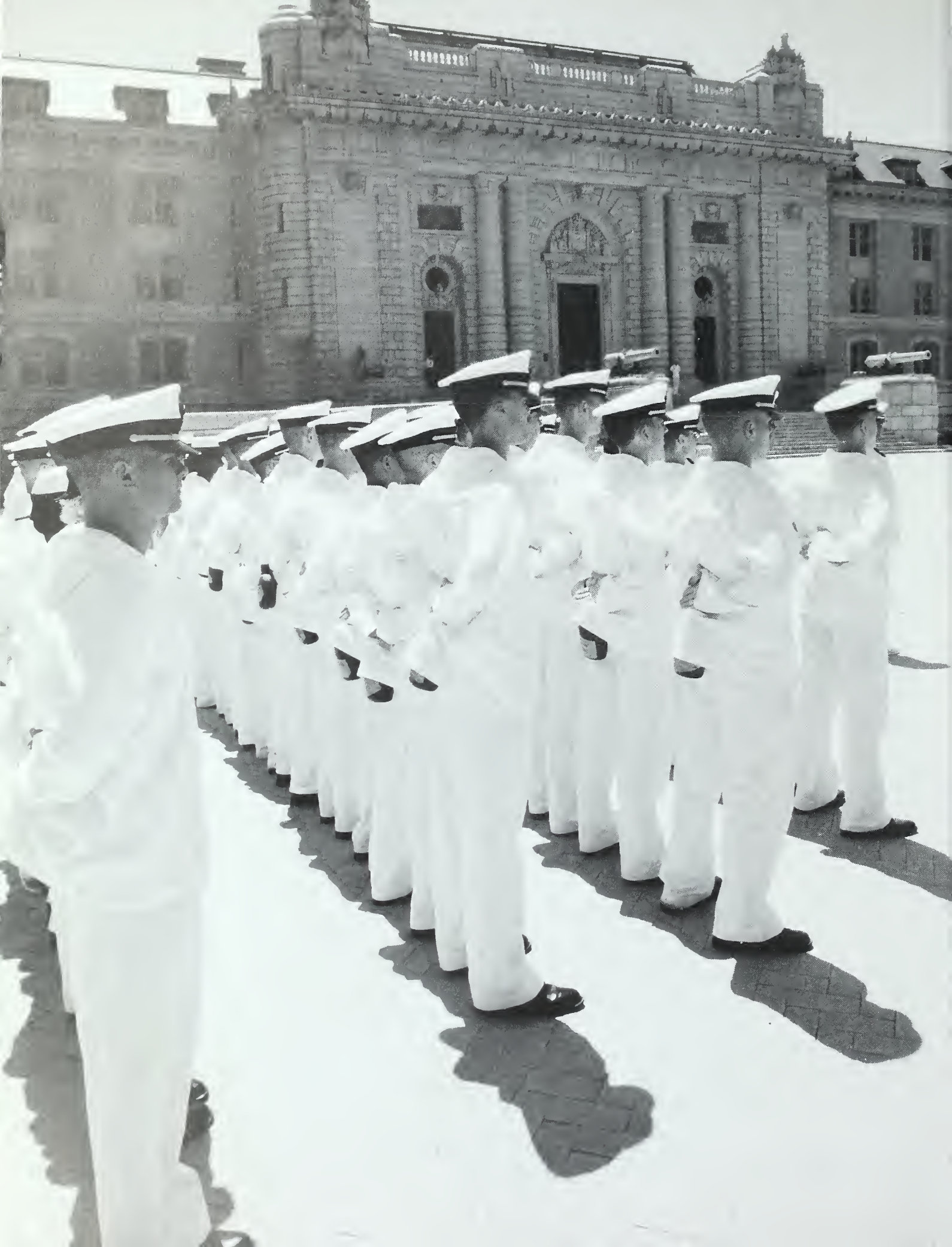
- Small class size. Most classes have no more than 22 students. When you are an upperclassman, some courses in your major may have only five to 10 other students.
- Low student-to-faculty ratio. Faculty members get to know you personally in and out of the classroom. They also are available to help with extra instruction or special projects. It's not unusual to find professors and midshipmen burning the late-night oil together in an academy research lab or at a computer terminal.
- Protected study time. Evening study period is reserved from 7:30 p.m. to midnight Sunday through Friday to help all midshipmen keep up with their courses. Additionally, Nimitz Library, computer labs and other facilities are open for midshipmen use all day and evening, seven days a week.
- Academic advising. To help you plan your curriculum, you get group and individual counseling as well as an academic adviser early in plebe year. A permanent faculty adviser is assigned when you select your major.
- Leadership and counseling. Your company officer and senior midshipmen also guide, monitor and evaluate your progress in academics, military performance and conduct. They also are ready to help in the event of problems, as are the academy's staff of chaplains and professional counselors.
- A sponsor program. Hundreds of families in the Annapolis area sponsor newly-arrived midshipmen, offering a home away from home and a place to relax off campus. More than enough families volunteer to give every midshipman a local sponsor. These contacts often grow into deep friendships that last a lifetime.

Your Commitment

Becoming a midshipman at the Naval Academy is a big step. It's not like starting your freshman year at a civilian college. You make a commitment to live a military lifestyle. You take an oath of office, promising to be loyal to your country and to defend it if necessary. You agree to be honorable in everything you do and say. You're also expected to work harder than you've ever worked before and to push yourself beyond your old limits. This is how we prepare you for the challenging responsibilities of service as a naval officer and the opportunities of a lifetime in the Navy and Marine Corps.









*All you that would be
seamen must bear a
valiant heart.*

—MARTYN PARKER

Admissions

Competition to become a midshipman is keen, but if you are of excellent moral character and have prepared yourself for a challenging, multi-dimensional four-year program and want to serve with distinction as a leader in the Navy or Marine Corps, you should apply for admission.

Applying to enter the Naval Academy requires some time and effort. Besides reviewing your academic record, our admissions board will evaluate your medical and dental health, physical fitness, leadership potential and motivation to be a midshipman and an officer in the Navy or Marine Corps. You must be recommended by teachers, interviewed by an academy representative and nominated by at least one of your official sources. Don't let the nomination requirement scare you; we'll guide you through the nomination process later in this chapter of the catalog.

We want to ensure that the best qualified candidates from around the United States and its territories are selected for admission and that these young men and women have the drive and motivation to complete the four-year program and excel as Navy and Marine Corps officers. All candidates have an equal opportunity for consideration, and eligible men and women of all backgrounds are strongly encouraged to apply. Minority group members typically make up approximately 20 percent of each class entering the academy and women usually comprise about 15-17 percent.

*U.S. News and World
Report Magazine's Year
2000 college ranking
placed USNA number four
on its list of top engineer-
ing schools in the nation.*

Naval Academy Dean of Admissions Dave Vetter, has a long association with the Naval Academy. Dean Vetter graduated with the Class of 1967 and first returned to Annapolis to serve on the faculty and teach economics as a Marine Corps Major. He was the recipient of the academy's William P. Clements Award for excellence in education in 1981. Later in his career, he served as the Academy's second Character Development Officer, and then, after 30 years of Marine Corps service, he became the Dean of Admissions in June 1997.



"The admissions process at the Naval Academy is unique in that we are not just selecting men and women for the purpose of attending a college, rather we are selecting young Americans to prepare them for a calling to service and a very special way of life.

Members of the Admissions Board spend countless hours reviewing candidate records. This is a tough job because of the breadth and diversity of our candidates' backgrounds. They are aspiring achievers; highly motivated, well-rounded students who excel not only academically, but also in athletics, leadership and service. The majority will enter directly from high school, but many others will come from college or prep school programs or from service as enlisted Sailors and Marines.

I personally believe that all of the candidates we accept can successfully complete the program if they maintain their desire and motivation. In fact, over the last ten years, the Naval Academy has averaged a graduation rate of more than 76 percent. I think this is attributable to the combination of our taking great care, first to match the right candidates to our program, and then to help them succeed while they are here.

If you have a strong will to achieve, desire a real challenge, and want to be a leader serving your country, the opportunity of a lifetime could begin for you at the United States Naval Academy. It is one of the greatest adventures you could possibly imagine!"

The arts of leadership and discipline are synonymous. No man is worth his salt without self-discipline.

—ADMIRAL JOHN S.
MCCAIN, JR.



Eligibility Requirements for Applying to the U.S. Naval Academy

You must be:

- at least 17 years of age and must not have passed your 23rd birthday on July 1 of the year of admission;
- unmarried, not pregnant and have no incurred obligations of parenthood;
- a United States citizen (except for the limited quotas of international midshipmen specifically authorized by Congress); and
- of excellent moral character.

Other Qualifications Necessary for Admission

You must:

- be found scholastically qualified by the admissions board;
- be medically qualified;
- pass the Naval Academy's Physical Aptitude Examination or similar test for the U.S. Military Academy or U.S. Air Force Academy; and
- receive an official nomination from one of many sources available (see following pages).

How to Become Competitive for Admission

To improve your chances of qualifying scholastically, your high school preparation should include the following:

- mathematics — four years of mathematics courses, including a strong foundation in geometry, algebra and trigonometry. Courses in pre-calculus or calculus are also very valuable and encouraged.
- science — one year of chemistry, with lab if possible.
- English — four years of course work with special attention to the study and practice of effective writing. Surveys of English and American literature are especially helpful as background for future study of literature.

To further enhance your competitiveness for admission, the following courses are also recommended:

- foreign language — at least two years. Course work should include regular use of the spoken language and encompass elementary syntax and grammar.
- physics — one year, with lab if possible.
- history — one full year of U.S. history and, where possible, a full year of European or world history.
- Computer skills- familiarity with the use of personal computers, including the Windows Operating System, word processing, spreadsheets and the Internet.

To demonstrate your ability to meet the physical and time management demands of four years at the Naval Academy, you should take part in athletic and non-athletic extracurricular activities. Since every midshipman is involved in physical exercise every day at the academy, it is important that you get in excellent physical condition while still in high school. Plebe Summer is not the time to try to whip yourself into shape. Since we are also interested in your leadership potential, as well as your ability to manage your time, we will carefully consider your non-athletic activities and record of part-time employment or military service to evaluate your versatility and ability to accept responsibility. And, by all means, stay away from illegal drugs and abuse of alcohol.



We must remember that one man is much the same as another, and that he is best who is trained in the severest school.
—THUCYDIDES



*The only way to compel
man to speak good
of us is to do it.*

—VOLTAIRE

The Brigade of Midshipmen represents the best this nation has to offer:

- 81 percent of the midshipmen attending the Naval Academy were in the top fifth of their high school class.
- 87 percent were varsity athletes in high school and 85 percent were letter winners
- 27 percent served as high school president or vice president

Steps Toward Gaining Admission

1. **Apply** for admission between April of your junior year in high school and January of your senior year in high school. Since many Congressional offices begin processing nomination requests during the summer and fall, the earlier you apply the better. You can also apply from college or the military service if you meet age requirements. In all cases, ask for information and a Pre-candidate Questionnaire by calling the Office of Admissions at 410-293-4361, or by writing: Office of Admissions, United States Naval Academy, 117 Decatur Road, Annapolis, Md. 21402-5018. Even faster response may be obtained by filling out the Pre-Candidate Questionnaire via the Naval Academy web page at: www.usna.edu/Admissions, by using the "Seniors Apply Now" link.
2. **Obtain** a social security number, if you do not already have one.
3. **Fill out** and return the Pre-candidate Questionnaire to the Academy. Based on the information in the questionnaire, particularly scholastic achievement, the Office of Admissions will advise you whether your present record is strong enough to be competitive for admission. If so, you will be identified as an official candidate and you will receive an application package.
4. **Apply** for a nomination. (See following pages.)
5. **Take** the SAT-I or ACT college admission tests. Check with your school counselor or visit their web sites (www.sat.org and www.act.org) for details of test dates and registration requirements. The two tests are designed differently and we have observed that most candidates perform significantly better on one than the other. Additionally, students often see a considerable test score improvement on a second or third attempt at both tests. The academy's Admissions Board uses the highest combination of verbal and math scores from all SAT-I or ACT tests taken by a candidate. Therefore, candidates will normally enhance their competitiveness at our Admissions Board simply by **taking both the SAT and the ACT more than once.** *Non-standard, un-timed tests are not acceptable.*

Test results from the January 2002 SAT-I test are the latest ones which will be used for evaluation by the Admissions Board for the Naval Academy Class of 2006. The college code number to be used to forward your SAT-I scores to the Naval Academy is 5809.

Test results from the February 2002 ACT test are the latest ones which will be used for evaluation by the Admissions Board for the Naval Academy Class of 2006. The college code number to be used to forward your ACT scores to the Naval Academy is 1742.

Official Candidates

1. If you are named an official candidate, you will receive a complete candidate application packet as early as June of the year prior to admission. *You should complete the forms and ensure they are returned to the Academy as soon as you possibly can, preferably within 30 days.* The Admissions Board will review your application to determine your scholastic qualification, as soon as all of your candidate packet forms are received.
2. Take the Physical Aptitude Examination. All official candidates must pass a standard Physical Aptitude Examination (PAE) to qualify for admission to the academy. The PAE tests your coordination, strength, speed and agility. If you are physically fit, the PAE should present no problem. *Admission to the Academy is extremely competitive and the Admissions Board reviews the PAE score, so you should strive to do your best.*

The candidate admissions packet provides the necessary forms and details on how to complete the PAE. The PAE may be administered by a teacher or school official with a degree in physical education or by a commissioned military officer on active duty.

3. Take the Qualifying Medical Examination. (Also see Appendix A.) The Naval Academy's program is physically demanding and because of the medical standards required for commissioning as Navy and Marine Corps officers, we require all candidates to undergo a thorough medical examination. After the Naval Academy determines you may be a competitive candidate, the Department of Defense Medical Examination Review Board (DODMERB) will advise you how to begin the examination process. Healthy candidates usually have little difficulty passing the examination. However, conditions are sometimes identified which could either be aggravated by our rigorous program or restrict military service after graduation. Some medical considerations, including our revised policy regarding tattoos and surgical/laser procedures to improve vision, are discussed in Appendix A.

4. Interview with a Naval Academy Information (Blue and Gold) Officer in your area (see the following pages for a listing of Blue and Gold area coordinators). If you have any questions about your candidacy at any point during the admissions process, your Blue and Gold Officer is your best resource for advice and for obtaining your specific admissions status. You will be provided a specific Blue and Gold Officer in your candidate packet, along with contact information for your follow-up purposes.

Obtaining a Nomination

All applicants must obtain a nomination from an official source during the admissions process. There are many sources of nomination, and applicants should apply to all sources for which they are eligible. These normally include at least one U.S. representative and two U.S. senators. See the sample letters on pages 24 and 25.

You should apply for a congressional nomination during the spring of your junior year in high school, or as soon thereafter as possible. Many members of Congress evaluate candidates during the summer months and make their decisions in early fall, though the Academy accepts nominations until the end of January. Applicants for military service-connected nominations (as described in following paragraphs) should apply directly to the Naval Academy for a nomination after July 1 of the year prior to admission.

Nomination sources

Applicants should seek nominations from the following sources as appropriate:

U.S. senators, representatives, the delegate to Congress from the District of Columbia, the resident commissioner of Puerto Rico.

Each member of Congress can have five constituents attending the Naval Academy at any one time. When a constituent leaves the Academy, a vacancy is created. Members may use any one of these methods for nominating candidates to fill their vacancies:

- nominate 10 candidates for each vacancy, permitting the Naval Academy to evaluate and select them for admission on a competitive basis;
- designate one principal nominee and nine other candidates as alternates, ranked in order of preference; or
- nominate one principal nominee and nine other candidates as competitors, permitting the Naval Academy to select the alternate competitors for admission.

We cannot always build the future for our youth, but we can build our youth for the future.

—FRANKLIN D. ROOSEVELT





Esprit de corps thrives not only on success, but on hardships and adversity shared with courage and fortitude.

—ORLANDO WARD

In each of these methods, one fully qualified nominee is offered an appointment to the Naval Academy to fill the vacancy. The remaining fully qualified nominees also are considered carefully, and many are selected for admission to fill the entering class from a national competition of qualified alternates.

Application dates: Each Congressional office has its own procedures and deadlines for accepting nomination requests. Most offices prefer that you contact them in the spring or summer of the year prior to admission to the Academy. Congressional nominations are due in the Nominations and Appointments by January 31 of the year of admission to the Academy.

Apply to: Both of your U.S. senators and your U.S. representative. You must be a legal resident of the state and congressional district to which you are applying, but it is not necessary to know your members of Congress personally.

In order to obtain the names of your senators and representative, go to the following web sites: www.senate.gov and www.house.gov. From there, you can go to each Member's web site for specific instructions on their application process, including which office to contact.

The governor of Puerto Rico, the resident representative from the Commonwealth of the Northern Marianas Islands, and the delegates to Congress from Guam, the Virgin Islands and American Samoa.

Puerto Rico, Samoa and the Northern Marianas Islands may each have one midshipman attending the Naval Academy. Guam and the Virgin Islands each may have two at the Academy. Ten nominations are permitted for each vacancy.

Apply to: the appropriate official.

The President

An unlimited number of presidential nominations are available for children and legally adopted children of career officer and enlisted personnel of the armed forces, active or reserve, including the Coast Guard. One hundred candidates may be appointed with these nominations each year. A parent in the Reserves must be serving as a member of a reserve component and be credited with at least eight years of service or must be entitled to retired pay except that he or she is not yet sixty years old. Otherwise, the parent must currently be on active duty (other than for training) and have served continuously for at least eight years or have been retired with pay or granted retired or retainer pay. If you have questions regarding your eligibility, please call (410) 293-4392.

Application dates: after July 1 of the year prior to admission, and before January 31 of the year of admission.

Apply to: Superintendent, United States Naval Academy, 117 Decatur Road, Annapolis, Md. 21402-5019, Attn: Nominations and Appointments Office. Students must apply directly to the Academy for this nomination. See sample letter on page 25.
Be sure to submit proper documentation to support your eligibility.

Children of deceased or disabled veterans and children of prisoners of war or servicemen missing in action

Up to 65 midshipmen may be in attendance at the Academy based on nominations as children of military personnel who were killed in action; died from wounds, injuries or disease while on active duty; sustained 100 percent disability from such wounds, injuries or disease, as certified by the Department of Veterans Affairs; or who are currently prisoners of war (POW) or missing in action (MIA). The children of civilians in POW or MIA status also are eligible. Legally adopted children are eligible.

Apply to: Superintendent, United States Naval Academy, 117 Decatur Road, Annapolis, Md. 21402-5019, Attn: Nominations and Appointments Office. See sample letter on next page. Be sure to submit proper documentation to support your eligibility.

Children of Medal of Honor Awardees

Candidates in this special category who are fully qualified for admission are automatically appointed. There is no limit to the number of midshipmen with this this source of nomination.

Apply to: Superintendent, United States Naval Academy, 117 Decatur Road, Annapolis, Md. 21402-5019, Attn: Nominations and Appointments Office. Be sure to submit proper documentation to support your eligibility. See sample letter on next page.

The Vice President

At any one time, five midshipmen may attend the academy based on a vice presidential nomination. Competition for a vice presidential nomination is extremely keen.

Application deadline: November 1 of the year prior to admission.

Apply to: Office of the Vice President, Washington, DC 20501. Send only your letter of application directly to the vice president's office. Other supporting material should be sent to the Office of Admissions, United States Naval Academy, 117 Decatur Road, Annapolis, Md. 21402-5017, Attn: Vice Presidential Applicant. See page 24 for a sample letter.

Regular and Reserve Navy and Marine Corps Members

One hundred seventy appointments are available annually to regular and reserve Navy and Marine Corps enlisted personnel. For more information, see your command's career counselor or call the enlisted accessions coordinator in the academy's Admissions office.

Reference: OPNAVINST 1420.1 or Marine Corps Order 1530.11series

Application deadline: January 31

Apply to: the Naval Academy via your commanding officer.

Naval Reserve Officers Training Corps (NROTC, NJROTC, MCJROTC); Honor Naval and Military Schools

Twenty appointments annually are available through nominations from these programs.

Apply to: your senior military instructor, professor of naval science or headmaster.



A Captain of the Navy ought to be a man of Strong and well-connected Sense with a tolerable education, a Gentleman as well as a Seaman, both in Theory and in Practice.
—JOHN PAUL JONES

The study of history lies at the foundation of all sound military conclusions and practice.
—ALFRED THAYER MAHAN





*The Vice President of the United States,
Richard Cheney*

Sample letters

Sample Letter Requesting a Vice Presidential Nomination

The Vice President
The White House
Washington, DC 20501

Dear Mr. Vice President :

It is my desire to attend the United States Naval Academy. I respectfully request that I be considered as one of your nominees for the class entering in July 2002.

The following personal data are provided for your information:

Full name: _____
(Print as recorded on birth certificate)

Name of parents: _____

Address: (Use ZIP code and provide phone number)

Permanent _____	Mailing _____
Phone _____	Phone _____
Date of birth: _____	Place of birth: _____

Social Security number: _____

High school attended: _____
(Name and address)

Date of high school graduation: _____ Sex: _____

My approximate standing is _____ in a class of _____.

I have/have not sent a Pre-candidate Questionnaire to the Naval Academy.

I have listed on the reverse side the results of any ACT or SAT-I test scores that I have taken.

I have been active in high school extracurricular activities as indicated on the reverse side.
I would greatly appreciate your consideration of my request for one of your nominations.

Sincerely yours,
(Signature)

Notes: Do not forward transcripts/supporting letters to the vice president's office. When you receive a candidate number, these documents should be forwarded only to the Admissions Office, United States Naval Academy, marked "Vice Presidential Applicant."

If you have not already completed and submitted a Pre-candidate Questionnaire, you may fill out the Preliminary Questionnaire online at www.usna.edu/Admissions/contact.htm. Written and verbal requests are accepted by the Office of Admissions, United States Naval Academy, by writing the Office of Admissions, United States Naval Academy, 117 Decatur Road, Annapolis, Md. 21402-5018, or by calling 410-293-4361.

Sample Letter Requesting a Presidential Nomination—

Also applies to children of deceased or disabled veterans, children of prisoners of war, servicemen missing in action or children of Medal of Honor awardees.

(This application should be submitted after June 1 of the year prior to admission and before January 31 of the year of admission.)

To: Superintendent, United States Naval Academy, 117 Decatur Road, Annapolis, Md. 21402-5019,
Attn: Nominations and Appointments Officer

Dear Sir:

Date: _____

I request a presidential nomination to the United States Naval Academy for the class that will enter in July 2002 and I submit the following data:

Name: _____

(Give full name as shown on birth certificate or, if changed, attach copy of court order.)

Address: *(Use ZIP code and provide phone number)*

Permanent _____

Mailing _____

Phone _____

Phone _____

Date of birth: _____

Social Security number *(must be filled in)*: _____

Name and address of high school/college: _____

Month/year of graduation: _____ Sex: _____

Ethnic origin: _____ *Caucasian, African-American, Hispanic, Asian-American, Native-American, Puerto Rican, Filipino, etc.*

Congressional district & state: _____

Applying to Senators and Congressman(names) _____

Highest scores: PSAT V _____, M _____; SAT-I V _____,

M _____ ACT E _____, M _____

If member of military, check here _____. List rate, serial number, component, branch of service, and organizational address on reverse side of this form.

Information concerning parents' military service:

Name of parent/s: _____

(Please indicate parent's rank, social security number or serial number, component, branch of service; and military status (active, reserve or retired with pay))

Sincerely yours,
(Signature)

Note: If you have not already completed and submitted a Pre-candidate Questionnaire, you may fill out the Preliminary Questionnaire online at www.usna.edu/Admissions/contact.htm. Written and verbal requests are accepted by the Admissions Office, United States Naval Academy, by writing the Office of Admissions, United States Naval Academy, 117 Decatur Road, Annapolis, Md. 21402-5018, or by calling 410-293-4361. In establishing your eligibility for a presidential nomination, you should determine which of the following four service-connected categories applies to your parent and forward supporting documents and information to the Naval Academy along with your letter of application for a nomination.

- Active duty officer: attach statement of service prepared by personnel officer specifying all periods of active duty.
- Active duty enlisted: attach statement prepared by personnel officer specifying all periods of active duty and listing dates of enlistment and dates of expiration of enlistment.
- Reserves: attach proof of current service, including a copy of current identification card and annual statement of reserve points or notice of eligibility for retirement.
- Retired with pay or deceased: furnish copy 4 of DD Form 214 or casualty report. If appropriate, include brief statement concerning the date, place and cause of death or details of disability together with the Veterans Administration claim number. If eligible, applicant will be given a nomination in the children of deceased or disabled veterans category.



*The President of the United States,
George W. Bush*

Selection for Appointment

We use a selection process known as 'rolling admissions.' As soon as all of your candidate packet forms are received, the Admissions Board will determine your scholastic "whole person" qualification. If your record of achievement is truly outstanding, you could receive an early offer called a Letter of Assurance. This indicates our intent to extend an Offer of Appointment provided all your remaining requirements (nomination, PAE, interview and medical) are successfully completed. A Letter of Assurance could be received as early as September of your senior year. Of course, final admission will depend on continued success and good standing in your high school as well as continuing to maintain your qualifications for the Naval Academy.

If you are found scholastically qualified but do not receive a Letter of Assurance, you will be competing for an Offer of Appointment from within your nominating sources. Approximately 2,000 candidates are found fully qualified (scholastic, medical, PAE, and have obtained a nomination) each year. Of that number, about 1,500 will receive appointments and approximately 1,200 become midshipmen. **Most candidates will be notified of their final status by April 15. All appointees should notify the Admissions Office of their intention to accept or decline by May 1. Except in very unusual circumstances, candidate files not completed by March 1 will normally not receive further consideration.**

Naval service obligation

When you accept an appointment, we send you several important documents and forms to consider and complete. One of the most important is the Agreement to Serve. This agreement, required by U.S. law (Title 10, U.S. Code, Sections 6959 and 2005) and other directives, outlines your service obligation and is signed on Induction Day around July 1 at the Naval Academy. It requires the consent of parents or guardian if you are a minor. In signing the Agreement to Serve, you state that you will:

- complete the four-year course of instruction at the Naval Academy.
- accept an appointment and serve as a commissioned officer in the reserve component of the Navy or Marine Corps. Graduating midshipmen will have military obligations of eight years, and five of those years will be served in an active duty status immediately upon graduation.
- serve in an appropriate enlisted grade on active duty for up to four years, or reimburse the United States for the cost of education received at the Naval Academy if you do not fulfill the conditions agreed to above.

Without a decisive Naval force we can do nothing definitive. And with it everything honorable and glorious.

—GEORGE WASHINGTON





Far better it is to dare mighty things, to win glorious triumphs, even though checked by failure than to take rank with those poor spirits who neither enjoy much nor suffer much, because they live in the gray twilight that knows neither victory nor defeat.

—THEODORE ROOSEVELT

Oath of Office

The Oath of Office, which must be signed and agreed to orally by U.S. citizens on Induction Day states the following:

“I, _____, having been appointed a midshipman in the United States Navy, do solemnly swear (or affirm) that I will support and defend the Constitution of the United States against all enemies foreign and domestic; that I will bear true faith and allegiance to the same; that I take this obligation freely, without any mental reservation or purpose of evasion; and that I will well and faithfully discharge the duties of the office on which I am about to enter, so help me God.”

This oath will be reaffirmed by the Fourth Class Midshipmen during their Plebe Summer.

Resignations and separations

If you enter the Naval Academy directly from civilian life, you assume a military obligation according to the Agreement to Serve. Midshipmen who do not fulfill this agreement could be transferred to the Navy or Marine Corps Reserve in an enlisted status and ordered by the Secretary of the Navy to serve on active duty for a period not to exceed four years, as provided by U.S. law, (Title 10, U.S. Code, Section 6959). However, in practice, the following policies currently apply to midshipmen who enter the academy from a civilian status:

- if you are discharged, or your resignation is accepted before the first day of classes of your second-class (junior) year, you are discharged from the naval service.
- if you leave the Academy after beginning the academic year as a second-class midshipman (junior) but before the start of first-class (senior) year, you are required to serve two years in an enlisted status unless you are considered physically disqualified, unfit or unsuited for military service; or you may be required to reimburse the United States for the cost of your education received at the academy.
- if you leave the academy after the start of first-class (senior) academic year, you incur a requirement to serve three years in an enlisted status, unless you are considered physically disqualified, unfit or unsuited for military service or provide monetary reimbursement
- if you refuse a commission upon graduation, your enlisted service requirement is four years, or monetary reimbursement must be provided.

To insure safety at sea, the best that science can devise and that naval organization can provide must be regarded only as an aid, and never as a substitute for good seamanship, self-reliance, and sense of ultimate responsibility which are the first requisites in a seaman and naval officer.

—ADMIRAL CHESTER W.
NIMITZ

If you enter the Naval Academy or the Naval Academy Preparatory School from the Navy or Marine Corps, the remaining period of your enlistment or obligated service is not terminated when you accept an appointment to the Academy. Therefore, if you do not fulfill the Agreement to Serve, you will return to enlisted status to complete the period of service for which enlisted or obligated, as provided by Title 10, U.S. Code, Section 516. In calculating the unexpired part of an enlistment or period of obligated service, time as a midshipman is counted as service under that enlistment or service obligation. However, if you are discharged or your resignation is accepted after beginning your second-class academic year at the Naval Academy, you incur the same obligations described above for those who enter the academy from civilian life.

In either case, if you leave the Naval Academy after the start of your second-class year or refuse a commission upon graduation and do not complete the active-duty service obligation, whether voluntarily or through misconduct, you can be required to reimburse the United States for the cost of education received at the Naval Academy. This cost is computed by the Naval Academy and includes the costs of professors' salaries, supplies and other expenses. It is comparable to the tuition at a first-rate private university. The amount to be reimbursed in a particular case varies proportionally with the period of unserved obligation, ranging up to the entire cost of education.

Costs and financial obligations

Before entering the Naval Academy, you must deposit \$2,200 to be used as partial payment for your uniforms and supplies. In cases of hardship, the deposit may be reduced or waived by the academy and then made up through deductions from your pay over four years as a midshipman.

An interest-free loan from the federal government is advanced to entering midshipmen to help defray first-year costs not covered by the deposit. This loan is repaid through monthly deductions from midshipmen pay during the first two to three years at the academy.

If you voluntarily leave the Naval Academy before repaying these and any other obligations, you must pay the debts in full before separation. If you are separated involuntarily, you must turn in enough uniforms and equipment suitable for reissue to pay your debts.





Police Record Checks

Each candidate receiving an offer of appointment is required to complete a routine Police Record Check with their local law enforcement agencies. The Naval Academy will send you forms that you must take to these offices. These background checks are a precursor to the National Agency Check (NAC) that will be initiated on Induction Day upon your arrival at the Naval Academy. The Police Record Check and the NAC are used to determine your credibility and suitability for service and to grant a security clearance for access to classified material.

Induction Day Requirements

Prior to Induction Day around 1 July, appointees must have proof of United States citizenship on file at the Naval Academy. Certificates must be an original or notarized copy. Any of the following documents are acceptable:

- U.S. Birth Certificate
- U.S. passport
- Consular Report of Birth Abroad
- Certificate of Citizenship
- Certificate of Naturalization

Name changes must be documented by a court order. Appointees without proof of citizenship on file will not be given the Oath of Office. Confirmation of immunization against common communicable diseases will be requested before induction. Specific instructions will be provided in the permit to report packet.

Reporting for Induction Day

If you accept an appointment to the Naval Academy, you will report for induction in early July, take the Oath of Office and begin Plebe Summer with your new classmates from across the nation. It will be one of the most important days in your life. We will tell you what you need to bring and how to make travel arrangements to Annapolis.

Privacy Act Statement

The Privacy Act requires Naval Academy officials to obtain written authorization from midshipmen in order to release information on grades, performance and conduct to parents or other interested parties unless otherwise authorized by law.

*Mine honor is my life; both
grow as one; take honor from
me and my life is done.*
—SHAKESPEARE





If a nation expects to be ignorant and free...it expects what never was and never will be.

—THOMAS JEFFERSON

Visiting the Academy

A personal visit to Annapolis can help you make a good decision about attending the Naval Academy. You and your family are encouraged to tour the Academy any day of the year during regular visiting hours, 9 a.m. to 5 p.m. You can take a guided tour with a commercial service in Annapolis or through the academy's own Armel-Leftwich Visitor Center. Call the Visitor Center at 1-800-778-4260 for guided tour schedules or visit the website at www.usna.edu/PAO/visitor.html.

Our admissions staff does not conduct guided tours, but admissions officers located in Leahy Hall are available to answer your questions from 8:30 a.m. to 5 p.m., Monday through Friday, and from 9 a.m. to noon on Saturday. No appointment is necessary. USNA admissions presentations are held Monday through Friday at 9 and 11 a.m., 2 and 4 p.m. and on Saturdays at 9 and 11 a.m.

Bancroft Hall Candidate Visitation Program(www.usna.edu/Admissions/cvweekend.htm)

This is a program for highly qualified candidates who are competitive for appointments. It is a great opportunity to spend one weekend with the Brigade of Midshipmen. During specific weekends between October and April, from 8:30 a.m. Friday until 11:30 a.m. Saturday, you live with your midshipman host, attend classes, eat in King Hall and sleep in Bancroft Hall. Admissions personnel will contact qualified candidates or official candidates may call 410-293-4361 regarding this visit opportunity.

Naval Academy Summer Seminar (www.usna.edu/Admissions/nass.htm)

The Naval Academy Summer Seminar offers an exceptional opportunity for high school seniors to experience the Naval Academy program firsthand for one week during the summer. This program provides a comprehensive look at the total Naval Academy experience, including academic programs, life as a midshipman, physical training and Navy and Marine Corps service options. Students interested in pursuing an appointment to the Academy should seriously consider attending the Summer Seminar. Midshipmen are in charge of the daily schedule and ensure each student leaves with a realistic view of Academy life. This fast-paced and exciting program is attended by more than 1500 students from around the world each year. If you want a challenging summer while exploring university-level academics and determining whether the Naval Academy will help you achieve your goals, then this program is for you.

Three one-week sessions are held during the first three weeks in June. During the six-day session you will live in Bancroft Hall (the dormitory where all midshipmen live), eat in the dining hall, attend academic workshops and participate in daily physical training and sailing. Each student attends eight 90-minute workshops, covering material from each of the majors programs offered at the Academy. Students will also have access to scientific labs and classrooms.

This is a competitive entry program due to the number of interested students and facility restrictions at the Academy. Recognizing the academic and physical focus of the program, students must meet the following general criteria:

- meet nominal admission standards
- High school student between their junior and senior year
- United States citizenship
- Unmarried, not pregnant, and have no incurred obligations of parenthood
- Superior high school performance: 3.5 +GPA (4.0 scale), ranking in the top 20 percent of the class;



- Have taken the PSAT, SAT-1 or ACT
- Demonstrated achievement in athletics and extracurricular activities
- Physically fit and in good health
- Positive attitude, self-disciplined and of excellent moral character.

Students can receive an application for the Summer Seminar by:

- submitting their name to Naval Academy Admissions via the webpage: www.usna.edu/Admissions. Students will receive the application material in February of their junior year; or by
- calling Naval Academy Admissions: (410-293-4361) in February of their junior year and requesting an application.

Selection is dependent upon the overall qualification of the student, the timeliness of their application, and our need to ensure demographic representation. There is a tuition fee for the Seminar which covers room and board for the week, as well as a variety of materials and T-shirts. Students are also responsible for providing their own transportation to and from the Naval Academy. Shuttle buses are provided to transport students to and from the Baltimore-Washington International Airport.



Students who do not apply for the Summer Seminar program, or are not selected to participate, should continue with the Academy admissions process if interested in pursuing an appointment.

Academy Admissions Day (www.usna.edu/Admissions/admday.htm)

Each year in the fall, the academy hosts an all-day information program for students interested in becoming midshipmen. This open house is the perfect opportunity for students in grades seven through eleven to learn more about the Naval Academy. Representatives from each of our academic departments, as well as athletic representatives and admissions staff will be available to answer questions. A tentative schedule of events is posted on our website.

Alternate Routes to Admission

If you are not selected for a direct appointment to the Naval Academy, the Academy's admissions board automatically considers you for selection to the Naval Academy Preparatory School (NAPS) and/or considers you for recommendation for a Naval Academy Foundation preparatory school program. A separate application for either of these program is not necessary.

Naval Academy Preparatory School (NAPS)

NAPS offers a 10-month college preparatory course to regular and reserve Navy and Marine Corps enlisted men and women who are seeking Naval Academy appointments. This program is designed to strengthen the academic background of incoming candidates. Navy and Marine Corps personnel who apply but are not appointed to the Naval Academy are automatically considered for admission to NAPS. The Admissions Board also identifies a number of promising and highly motivated civilian candidates who are not successful on their first attempt at admission and offers them the opportunity to enlist in the Naval Reserve for the express purpose of attending NAPS to prepare for admission to the Naval Academy. For more information, visit our webpage: www.usna.edu/Admissions/naps.htm.

Naval Academy Foundation

The United States Naval Academy Foundation, Inc., also assists promising candidates who are not appointed in their first try for admission. This nonprofit organization awards a limited number of sponsorships for post-high school preparatory studies to enhance those candidates' qualifications for admission. Visit the Foundation's webpage for more information: www.usna.edu/Admissions/fndation.htm.

Cash grants of assistance are sometimes made by the Foundation to the participating college or prep school selected. Families of applicants are expected to contribute within their means.

Self-discipline is that which, next to virtue, truly and essentially raises one man above another.

—JOSEPH ADDISON

The 2000 Princeton Review ranked USNA:

- No. 1 college administration in the nation.
- No. 2 for accessibility of professors
- No. 4 on the "stone-cold sober" list (opposite of party school)
- No. 5 for toughest to be admitted
- No. 14 on popularity of intercollegiate sports
- No. 15 for highest number of study hours put in by students.

Other Considerations

Appointments of women

Women have been fully integrated into the Brigade since Congress authorized their entry into the service academies in 1976.

Based on the needs of the Navy and Marine Corps, women typically comprise about 15 to 17 percent of each entering class. Admissions standards are the same as those for men, with the exception of some allowances made for physical differences between men and women.

The Academy offers women the same opportunities to excel as are extended to men: a challenging academic curriculum to promote intellectual development; a physical training program to build strength, agility, endurance and self-confidence; and a military environment to develop discipline, military skills and leadership. Upon commissioning, the only restrictions for women are in submarine, special warfare, and Marine Corps ground combat arms assignments. Other warfare specialties are available to women, including naval aviation and surface warfare.

Previous applicants

If you applied before but were not appointed to the Naval Academy, you may reapply for admission with a subsequent class. The application process is the same. In general, we recommend you retake your SAT or ACT tests. Also, if you are taking college or prep school courses, we suggest you take courses similar to those required of first-year midshipmen, such as calculus, chemistry and English.

Home-schooled candidates

Home-schooled students make up an increasing number of applicants for admission to the United States Naval Academy each year. You should request an application as early as spring of the year before you wish to enter the Academy. Each applicant is reviewed on a case-by-case basis, but we generally look for the same academic prerequisites as traditional high school applicants. Additionally, include in your application a profile of your home school program, the accrediting agency and whether the State Board of Education recognizes the program. Home-schooled applicants should also demonstrate participation in local extracurricular activities, both athletic and non-athletic. Guidelines are located on our website at www.usna.edu/Admissions/homeschoolers.htm.

Readmission of former midshipmen

Former midshipmen desiring to re-enter the Naval Academy are eligible to apply for re-admission one year following their separation from the Academy. The Academy's Academic Board makes the final determination regarding the readmission of former midshipmen. Like any other candidate, you must obtain a new nomination, re-qualify medically and not be past your 27th birthday on July 1 of the year you would graduate from the Academy to be eligible for consideration. Requests should be addressed to the dean of admissions.

International students

Public Law authorizes each U.S. service academy to accept 40 exceptional international students officially sponsored by their respective governments. The Department of Defense, in consultation with the Department of State, selects and notifies the countries that may nominate candidates. Selection of nominees to attend the Academy is made by the Naval Academy Admissions Board in late April each year.



Naval Academy Information (Blue and Gold) Officers

You will undoubtedly have many questions about the Naval Academy and the naval service before you make a commitment to pursue an appointment. We want to help you make the right decision. Several resources are available to help you find out all you can about the Academy and the professional opportunities available to you after graduation. You may view our web page at www.usna.edu/Admissions. In Annapolis, the Admissions Office offers detailed information about the academy's program and admissions procedures. Call the office at 410-293-4361 or write to the address on the back cover. The Admissions Office also coordinates a nationwide network of trained Naval Academy Information ("Blue and Gold") Officers. These officers, located in every state, are well qualified to counsel you on all aspects of the Naval Academy. The following state and area coordinators can help you find the name and address of the nearest Blue and Gold Officer.

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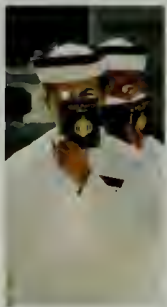
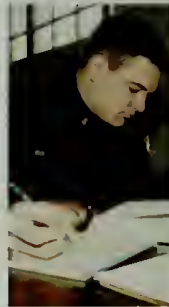


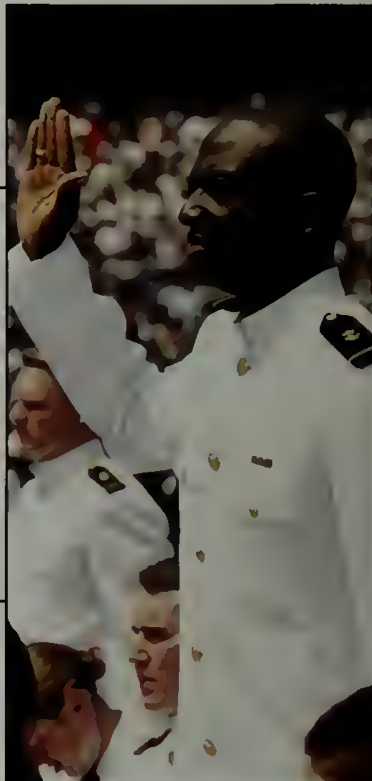


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How are the four years organized?

	Plebe Summer	Fourth Class Year (Freshman)	Third class Year (Sophomore)	Second Class Year (Junior)	First Class Year (Senior)	Graduation
Education:	<p>Validation exams, initial academic counseling.</p> 	<p>Required courses: calculus, chemistry, leadership, literature, history, naval science, and government. You will decide on your major course of study during the second semester of plebe year.</p>	 <p>Required courses: mathematics, naval engineering, military ethics, navigation, history, physics: basic courses in major.</p>	<p>Required courses: electrical engineering, weapons systems, leadership and ethics, strategy and tactics; required courses for major.</p>	 <p>Required courses: law, officer practicum, weapons systems; required courses for major or special study programs such as Trident Scholars.</p>	<p>Bachelor of science degree awarded in 18 subject areas. Seven in engineering, seven in science and math, four in humanities and social sciences.</p>
Professional Training:	<p>Military orientation, character development, seamanship (sailing), small arms (pistol), physical training.</p>	<p>Courses in naval science and leadership. Seminars on character development. Hands-on experience with basic ship handling on board yard patrol craft. Indoctrination to Navy ships and aircraft and military etiquette.</p>	<p>Leadership experience: Third class cruise: three weeks of navigation/seamanship training at sea and three weeks of sail or naval tactical training for a total of 6 weeks.</p>	<p>Leadership experience: in charge of fourth class and third class training. Second class cruise training includes one week each of marine, air and submarine orientation. Four-week fleet cruise in a petty officer-type role. Character development seminars.</p>	<p>Leadership experience: direct training and activities of the brigade. First class cruise: 8 weeks of training with a minimum of 4 weeks with the fleet as a junior officer. Character development seminars.</p>	<p>Officer commissions as an ensign in the United States Navy or second lieutenant in the United States Marine Corps.</p>
Physical Education and Athletics:	<p>Plebes are introduced to many of the 30 varsity sports, 14 club, and 11 intramural sports offered at the academy, ranging from football to sailing, pistol to lacrosse. Midshipmen choose a sport each season over the four years. Tests in physical readiness include sit-ups, push-ups and the 1.5 mile run.</p>	<p>Classes in weight training, personal conditioning and swimming. Physical readiness tests are administered each semester.</p> 	<p>Instruction in boxing, wrestling and swimming. Physical readiness tests are administered each semester.</p>	<p>Classes in swimming and judo. Midshipmen choose an elective, ranging from basketball to golf, first aid to swim conditioning. Physical readiness tests are administered each semester.</p>	<p>Midshipmen choose electives each semester. Physical readiness tests administered each semester.</p>	
Extra-curricular Activities: (ECAs)		<p>More than 70 recreational professional and athletic ECAs offered throughout the four years at the academy. Includes club sports of boxing, judo, karate, power lifting, trap and skeet, rugby, ice hockey, tennis and softball.</p>		<p>Professional and academic ECAs open to all midshipmen include Dolphin Club, Silent Drill Team, Semper Fidelis, Surface Action Group, Mountaineering Club, Midshipman Action Group, and Naval Academy Foreign Affairs Conference.</p>	<p>Recreational ECAs available throughout the four years include archery, chess and scuba. Musical ECAs such as the Drum and Bugle Corps, choirs, Glee Club, Pipes and Drums, and Masqueraders also are offered. Other activities include Lucky Bag, Brigade Activities Committee, WRNV Radio.</p>	

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Life at the Naval Academy



Discipline is the soul of an army. It makes small numbers formidable; procures success to the weak, and esteem to all.

—GEORGE WASHINGTON

It would be impossible to predict what four years at the Naval Academy would be like for you personally, but we can describe our philosophy, our curriculum and the daily life you can expect. Only when you experience the exhausting rigors of Plebe Summer, only when you face the responsibility of commanding other midshipmen and only when you throw your hat into the air at graduation will you really know what the Naval Academy experience is all about. We can explain that the four years at Annapolis are tightly structured. While there are many ways you can pursue your individual areas of interest, a four-year program is required of all midshipmen. In this section, we will give you a general description of life at Annapolis. Later chapters give you the details of the academic, athletic and professional training programs.

Definitions

Let's start with a few basics. On your first day at the academy, you begin learning a whole new vocabulary of nautical and Naval Academy terms. Before long, the floor is 'the deck,' the wall is 'the bulkhead' and the restroom is 'the head'. Likewise, midshipmen seniority is stated in a way different from traditional college terms.

All Naval Academy students, men and women, are called midshipmen, which is a rank between chief warrant officer and ensign in the Navy. A midshipman first class is a senior. The student body is the Brigade of Midshipmen, or simply 'the brigade', and the naval service often is called 'the fleet'. The brigade is divided into six battalions. Five companies make up each battalion, making a total of 30 companies. The midshipmen command structure is headed by a first class midshipman, chosen for outstanding leadership performance to be brigade commander. He or she is responsible for much of the brigade's day-to-day activities as well as the professional training of midshipmen. Overseeing all brigade activities is the Commandant of Midshipmen, an active-duty Navy officer of rear admiral's rank or above. Working for the commandant, experienced Navy and Marine Corps officers are assigned as company and battalion officers.

Living with Honor

The Honor Concept of the Brigade of Midshipmen was established by midshipmen to urge all hands to carry out their duties with the highest sense of personal integrity and honor. It represents the minimum standard that midshipmen are expected to follow. Honor, integrity, and loyalty to the service, its customs, and its traditions, are fundamental characteristics

essential to a successful Naval officer. The offenses of lying, cheating, and stealing are intolerable in the brigade and may be cause for separation from the Naval Academy. The emphasis is on “doing what is right” rather than simply not breaking the rules.

To underscore their commitment to living a life of honor, midshipmen developed and implemented a living document known as the Honor Treatise of the Brigade of Midshipmen. The Treatise is a positive and uplifting statement directly from the midshipmen expressing who they are and what they are striving to achieve. In their own words, it sets forth the common goals and ideals which midshipmen envision for themselves at the Naval Academy as well as in the fleet. The Honor Concept and Honor Treatise are the brigade’s way of preparing its men and women for a life of honorable service to their country. After all, the future of the Navy, Marine Corps, and Naval Academy relies on its men and women, and their dedication to strive to do that which is right.

Four-Year Summary

The pull-out chart on the following page provides a diagram showing the highlights of the Naval Academy’s four-year program. Each year at the academy builds on the learning and experience of the previous year. As you complete basic courses and begin advanced studies, you also take on more responsibility in leading underclassmen at Annapolis and acting as a junior officer during summer professional training with the fleet.

Life in the Brigade

No matter what your background, chances are the living arrangements at the academy are different from anything you have experienced. The day begins with reveille and ends with lights out. You stand watches, march to meals and wear uniforms for almost everything you do. You and your roommates must keep your room ready for a military inspection at any time and keep your uniforms in regulation condition. Demerits are awarded for a room or uniform that is not in proper order or “squared away.”

All midshipmen live in Bancroft Hall, a huge dormitory complex. You are assigned to a room with one or more midshipmen and live in close proximity to about 130 other midshipmen in your company. Men and women midshipmen from all four classes make up each company. Each company has its own living area, called the wardroom, for meetings and recreation. Midshipmen rooms are wired for computers, Internet access and phones.

A leader is a man who has the ability to get other people to do what they don't want to do, and like it.

—HARRY S TRUMAN



Rear Admiral Samuel J. Locklear III is the 78th Commandant of Midshipmen. He is a 1977 graduate of the United States Naval Academy and a Surface Warfare Officer. Rear Admiral Locklear has commanded the USS Laffewich and most recently served as Commander, Destroyer Squadron TWO, which deployed with the USS Dwight D. Eisenhower Battle Group. As Commandant, he oversees the professional development and day-to-day lives of the Brigade of Midshipmen.



"An appointment to the U.S. Naval Academy is an extraordinary gift from the American people, and is the first step in joining a proud tradition of leadership and honorable service to our great nation. The U. S. Naval Academy will provide you with a top notch academic education, superior athletic opportunities and an unparalleled character and leadership development experience—an experience that will provide you the foundation necessary to lead the men and women of our Navy and Marine Corps team.

As a Midshipman you will be held to a higher standard than that of your peers. You will be expected to conduct yourself as an officer at all times. Honor and integrity will be paramount in every aspect of your life. You will participate in sports year round and be exposed to myriad unique leadership opportunities that only the U. S. Naval Academy can provide. Your summers will be spent around the world operating in the fleet with the Navy and Marine Corps team. Whether you are flying off of an aircraft carrier, sailing the seven seas, transversing the ocean depths or serving in the field with our Marines, you will experience first hand the exciting opportunities that await you upon graduation and commissioning.

The Naval Academy is an experience unlike any other. Successful completion will require your undivided Honor, Courage, and Commitment. The challenge is great but the opportunities are limitless. Will you accept the challenge?"

The company is the most important unit of the 4,000-member Brigade of Midshipmen. Many of your most rewarding experiences at the Naval Academy are those you share with members of your company. You eat, sleep, study, drill, play and compete as teams with your company mates. You learn to trust and rely on each other. The company experience also gives you an idea of how things work in the Navy and Marine Corps, where small-unit cohesion, teamwork and morale are as important in peacetime operations as in combat. Each year, companies compete for the title, 'Color Company', the best in the brigade. The year-long color competition among the 30 companies is one way company spirit is built. Companies accumulate points for academic, professional and intramural excellence. The company with the most points is recognized at the Color Parade during Commissioning Week and then enjoys special privileges for the next year, including the honor of representing the Naval Academy at official functions such as presidential inaugurations.

The right of commanding is no longer an advantage transmitted by nature, like an inheritance; it is the fruit of labors, the price of courage.

—VOLTAIRE





Plebe Summer

All midshipmen begin the four-year program with Plebe Summer, a period designed to turn civilians into midshipmen. Plebe Summer is no gentle easing into the military routine. Soon after entering the gate on Induction Day, you are put into uniform and taught how to salute by the first class midshipmen and officers who lead the plebe indoctrination program. For the next seven weeks, you start your days at dawn with an hour of rigorous exercise and end them long after sunset, wondering how you will make it through the next day. Forget television, leisure time or movies. You will have barely enough hours in the day to finish your assigned plebe tasks.

The frantic, exhausting pace of Plebe Summer leads you somewhere. It gets you ready for your responsibilities when the brigade returns from summer training and the academic year begins. The summer also builds the foundation for the tangible and intangible qualities that make an outstanding naval officer. You learn self-discipline. You learn to organize your time and decide which things are most important. You reach top physical condition. You develop your ability to think clearly under stress and to react quickly when the unexpected comes your way. Any officer who has stood the watch on the bridge of a ship in a storm or landed a jet on the deck of an aircraft carrier at night can tell you the importance of these qualities.

Plebe Summer introduces you to the basic how-to's of the Navy as well. Aboard Naval Academy sailboats, you learn to respect the power of wind and current. In motor boats and yard patrol craft, you learn the basics of seamanship, navigation and boat handling. On the weapons range, you learn how to fire small arms safely and accurately. You also learn why we have high standards of honor, character and morality. And, you begin to develop your own ideas about leadership and the techniques that will make you an effective leader when your turn comes.

Academic Year

When the upperclassmen return to the academy in late August to begin the academic year, you begin a routine that becomes very familiar during your four years. A typical weekday schedule looks something like this:

5:30 a.m.	Arise for personal fitness workout (optional)
6:30 a.m.	Reveille (all hands out of bed)
6:30 - 7:00 a.m.	Special instruction period for plebes
7:00 a.m.	Morning meal formation
7:10 a.m.	Breakfast
7:55 - 11:45 a.m.	Four class periods, one hour each
12:05 p.m.	Noon meal formation
12:15 p.m.	Noon meal for all midshipmen
12:40 - 1:20 p.m.	Company training time
1:30 - 3:30 p.m.	Fifth and sixth class periods
3:30 - 6:00 p.m.	Varsity and intramural athletics, extracurricular and personal activities; drill and parades twice weekly in the fall and spring
5:00 - 7:00 p.m.	Supper
7:30 - 11 p.m.	Study period for all midshipmen
11:00 p.m.	Lights out for plebes
Midnight	Taps for upperclass

When you add to this schedule the time required for military duties, inspection preparation and extra academic instruction, you can see the demands on your time are considerable.

True valor lies in the middle between cowardice and rashness.

—CERVANTES

Leadership Responsibility

As you progress through the years at the academy, leadership responsibilities grow. Each year, you and your classmates assume more important roles in running your company, your battalion and the brigade. By the time you are a first class midshipman, you are making daily decisions affecting the morale and performance of other midshipmen. You are teaching them the fundamentals of the naval profession and helping them through difficulties. You are leading them through personal example, communications, rewards and discipline and other techniques you have learned in the classroom and through three years experience. Your leadership responsibilities also increase in summer professional training. After learning what it is like to be a Sailor aboard ship during second class cruise, you undertake the duties of a junior officer during your first class summer cruise.

You build your leadership skills in these and other settings, where you can learn from mistakes and benefit from the guidance of seasoned Navy and Marine Corps officers. By the time you take your position as a naval officer responsible for leading talented Sailors and Marines, you know what leadership techniques and styles work best for you in different situations.

Religious Activities

The copper-green dome of the Chapel towers over the other buildings in the Yard at the Naval Academy and, in a sense, serves as a symbol of Annapolis to the outside world. This is more than a coincidence. Over the decades of our history, fighting Americans have learned by experience that there is a dimension to military leadership—both in and out of combat—that is essential to real effectiveness. This is the spiritual factor, the intangible quality we call moral courage.

It is this aspect of the academy's mission that the Command Religious Program strives to fulfill: to foster spiritual growth and promote the moral development of the midshipmen within the tenants of their particular faith or beliefs. The Chaplains Office serves the religious and spiritual needs of the Brigade by ministering to the midshipmen through pastoral care, spiritual and religious mentoring, ritual and sacramental obligations and by providing pastoral care for all, regardless of their faith background.

While attendance at religious services is optional, midshipmen are reminded that as officers of the naval service, their personal beliefs will often be tested, and that in time of stress their subordinates will look to them for spiritual as well as professional guidance. The Naval Academy has long believed that future officers owe it to themselves and to those they will lead to gain insights into moral, ethical and spiritual dimensions of military leadership. Midshipmen are encouraged to take full advantage of opportunities for worship and moral development at the academy. From the first day of Plebe Summer until the day of commissioning four years later, the academy's staff of six chaplains serves and ministers to the needs of the Brigade of Midshipmen. Among other things, they provide personal counseling, ranging from faith-centered issues through crises of life and death to future marriage plans.

In exercising a ministry of "presence" throughout the daily life of the brigade, chaplains sponsor and participate in Bible studies, prayer groups and religious instruction classes. They visit in company areas and are involved in a host of other brigade activities—all of which are designed to share and build lasting spiritual resources and to cultivate the strength and inspiration that comes from a deeply personal relationship with God.

Reason is God's crowning gift to man.

—SOPHOCLES





Recreation

All midshipmen are encouraged to take part in one or more of the academy's many clubs and extracurricular activities. For plebes especially, these activities help to relieve the stress of academics and the tough military routine. After plebe year, your free time increases. You may relax, pursue personal interests, date and explore the local area. There's much to see and do in Annapolis, Baltimore and Washington, D.C. There also are many cultural, social and sports activities sponsored by the academy.

United States Naval Academy Flying Squadron

The Naval Academy Flying Squadron provides interested midshipmen the opportunity to gain practical flight experience in general aviation and to work toward obtaining a private pilot's license or, for licensed pilots, an instrument rating or certified flight instructor designation. The squadron operates a fleet of Cessna 172 SP aircraft out of a regional airfield near the Academy. Qualified midshipmen may join the USNA Flying Team and compete at the intercollegiate level in National Intercollegiate Flying Association meets. The squadron also sponsors events that afford midshipmen a greater understanding of naval aviation. For more information about the Flying Squadron, visit our Web site at: www.usna.edu/FlyNavy.

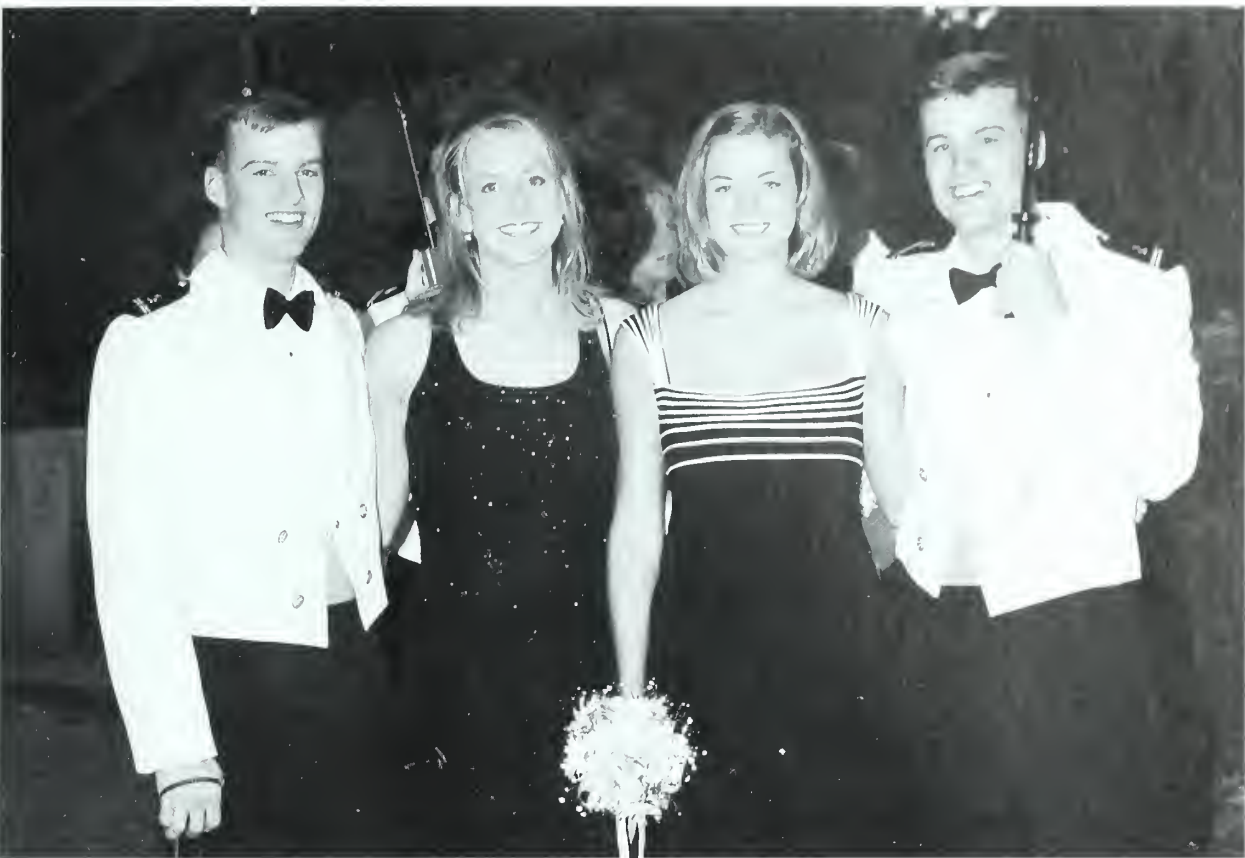
Spectator Sports

On autumn weekends, the excitement and color of Navy football sweeps the brigade. All midshipmen attend home games in Navy-Marine Corps Memorial Stadium. Groups of midshipmen also attend most away games. The football season ends with the whole brigade cheering on the team in the traditional Army-Navy game. There are 29 other varsity Navy teams to cheer on as well. Outstanding spectator facilities bring out enthusiastic Navy supporters for almost every rivalry from wrestling and swimming to lacrosse, basketball, soccer and baseball.

Plebe Sponsor Program

During Plebe Summer, every midshipman is introduced to an Annapolis-area family that has volunteered to host midshipmen for dinners, local sightseeing, recreation and simple relaxation away from the demands of the Yard. Many sponsor relationships last long beyond the academy years.





Social Events

The Brigade Activities Committee plans several special weekends during the year, including events like the annual International Ball with young guests from foreign embassies in Washington, D.C. Midshipmen groups also plan and participate in theatrical events, concerts and dinners. Senior naval officers join midshipmen regularly for traditional mess nights featuring formal rules of order, formal toasts, skits and good-natured fines. Individual companies of midshipmen often organize their own special activities on weekends. Certainly the highlight of our social calendar is Commissioning Week in May—five days of dances, garden parties, parades, concerts, sailing and a Blue Angels flight demonstration leading to graduation and commissioning of the first class midshipmen.

Cultural Affairs Program

We take advantage of our proximity to Washington, D.C. and Baltimore to arrange tickets and transportation to cultural events in those metropolitan areas. Plays, symphonies, operas and ballets at Washington's Kennedy Center and other theatres are open to midshipmen from all classes.

With the Bob Hope Performing Arts Center at Alumni Hall, the Naval Academy is able to provide a wide variety of theatrical and concert events to midshipmen. The Distinguished Artists Series, which presents performers of international renown, is the centerpiece of the program. Masqueraders productions, musicals, glee club concerts, chapel organ recitals, music concerts, Naval Academy Band concerts and chamber music recitals round out the action-packed year of events on the Yard. Many other cultural activities, including poetry readings and lectures by leading American authors, are offered at the academy.

Extracurricular Activities

Even with a midshipman's demanding academic and athletic schedule, you will have time for extracurricular activities (ECAs). We have more than 70 that give midshipmen a chance to share recreational, professional and athletic interests. Most of the ECAs are run by midshipmen.

Musical/Theatrical

Catholic Choir
Drum & Bugle Corps
Glee Club (Men)
Glee Club (Women)
Gospel Choir
Masqueraders
Pipes & Drums
Protestant Choir
Trident Brass

Athletics/Club Sports

Aerobics Club
Aikido Club
Boxing Club
Combat Pistol Club
Cycling Club
Gymnastics Club (Women)
High Power Rifle Club
Ice Hockey Club
Judo Club
Karate
Lacrosse (Men)
Lacrosse (Women)
Marathon Club
Pistol Club
Powerlifting Club
Public Relations Committee
Rugby Club (Men)
Rugby (Women)
Softball (Women)
Tennis (Women)
Trap and Skeet Club
Triathlon Club
Volleyball (Men)

Professional

Dolphin Club
Leadership Library
Naval Academy Dive Unit
Naval Academy Flying Squadron
Semper Fidelis Society
Surface Action Group
Yard Patrol Squadron

Recreational

Amateur Radio Club
Chess Club
Mountaineering Club
Public Speaking Club
Scuba Club

Academic

American Institute of Aeronautics & Astronautics
American Nuclear Society
American Society of Mechanical Engineers
Association of Computing Machinery
Astronomy Club
Chemistry Club
Churchill Society
Debate Club
French Club
Golden Key National Honor Society
Institute of Electrical and Electronic Engineers
Math Club
Model United Nations
National Society of Black Engineers
Naval Academy Foreign Affairs Conference
(NAFAC)
Omicron Delta Epsilon
Oceanography Club
Phi Alpha Theta
Phi Kappa Phi
Sigma Pi Sigma
Society of Automotive Engineers
Society of Naval Architects &
Marine Engineering
Society of Women Engineers
Tau Beta Pi

Publications

Lucky Bag
Reef Points

Community Service

Campus Girl Scouts
Midshipman Action Group
National Eagle Scout Association

Heritage

Midshipmen Black Studies Club
Chinese-American Club
Filipino-American Club
Japanese-American Club
Korean Midshipmen Club
Latin American Studies Club

Religious

Baptist Student Union
Catholic Midshipmen Club
Fellowship of Christian Athletes
Jewish Midshipmen Club
Latter Day Saints Student Association
Navigators
Officers' Christian Fellowship
Protestant Midshipmen Club

Brigade Support

Brigade Activities Committee
Brigade Social Affairs Committee
Cannoneers
Cheerleaders
Ring and Crest Committee
Silent Drill Team







*Any healthy organization
can survive individual
divergencies, and may
even profit from them.
Compulsory unification
of opinion can only
achieve the unanimity
of the graveyard.*

—VICE ADMIRAL HYMAN
RICKOVER

Local and Area Attractions

The Naval Academy lies adjacent to historic downtown Annapolis, which is famous for its state capitol, colonial homes and waterfront. The city dock is the focal point of the Annapolis waterfront. Workboats outfitted for harvesting crabs and oysters berth next to million-dollar sailing yachts and power boats. During mild weather, the dock is the scene of concerts, boat shows and festivals mixing midshipmen and local citizens with thousands of tourists. For a small city of 35,000, Annapolis is very sophisticated, offering many fine restaurants, boutiques, art galleries, museums, a repertory theater and a symphony orchestra. Several large shopping centers and malls are located in the suburbs.

Maryland's largest city, Baltimore, is approximately 30 miles from Annapolis and the Naval Academy. Baltimore's Inner Harbor offers a wide variety of specialty shops, eateries and entertainment. The Maryland Science Center and the National Aquarium are also there. Greater Baltimore also has theatres, galleries, museums and a zoo. For sports enthusiasts, there are race tracks, a professional indoor soccer team, a minor league hockey team, the Orioles baseball team and the Ravens football team.

Due west of Annapolis lies Washington, D.C., our nation's capital. Washington is home to the Smithsonian Institution with its museums of Natural History, American Art, American History and Air and Space. There are hundreds of other attractions ranging from art galleries, symphonies, opera, ballet and off-Broadway theatre to rock and jazz concerts, ethnic festivals and scenic parks. Washington also has its share of professional sports teams including the Redskins in football, the Wizards in basketball and the Capitals in ice hockey.

Midshipmen Pay and Benefits

The Navy pays for the tuition, room and board, and medical and dental care of Naval Academy midshipmen. You also enjoy regular active-duty benefits including access to military commissaries and exchanges, commercial transportation and lodging discounts and the ability to fly space-available in military aircraft around the world. Midshipmen pay is \$699 monthly, from which laundry, barber, cobbler, activities fees, yearbook and other service charges are deducted. Actual cash pay is less than \$100 per month your first year, increasing each year to over \$300 per month in your fourth year.

Leave and Privileges

The Naval Academy's combined academic, military and physical development programs demand a lot of effort, requiring you to spend more time on campus than the typical civilian college student. But midshipmen enjoy Christmas and summer vacations (leave) plus shorter periods of time off (liberty). Free time to be away from the academy is based in large part on assigned military responsibilities, performance in academic and military endeavors and class seniority. You earn more liberty and privileges each year you advance at the academy. All midshipmen generally are granted leave during these periods:

- Thanksgiving leave;
- a Christmas vacation at the end of the fall semester;
- mid-term leave during spring semester;
- a short break at the end of spring semester and before Commissioning Week;
- a month-long summer vacation for all but new plebes, staggered according to the summer's professional training schedule.



*Conduct is three-fourths
of our life and its
largest concern.*

—MATTHEW ARNOLD

During semesters of the academic year, off-campus privileges fall into two categories: town liberty and weekend liberty. Weekend liberty permits you to leave the academy after your last military obligation on Saturday morning and return Sunday evening. Liberty curfews differ according to seniority. You are not eligible for liberty if you are assigned a military watch (rotated responsibilities) or if you are having serious difficulty in academics, conduct, military performance, or physical education. Generally, town and weekend liberty is authorized for midshipmen as follows:

- Plebes have town liberty on Saturday afternoons and evenings and liberty within the Naval Academy complex on Saturday mornings and Sunday afternoons. Special weekend liberty may be granted on special occasions.
- Three liberty weekends each semester are authorized for third-classmen, five a semester for second-classmen and eight for first classmen. Additional weekends may be granted based on individual performance.
- Upperclass midshipmen have town liberty all day Saturday, Sunday morning and afternoon. Specific weekday liberty may be granted based on company performance.

Motor Vehicles

Restrictions apply to your use of motor vehicles as a midshipman. This is necessary because parking space is very limited at the academy and in Annapolis. Also, you have limited time off in the first years to make use of a private vehicle. These are the current rules:

- Third-class midshipmen and plebes are not permitted to operate motor vehicles except when authorized leave, such as during Christmas vacation.
- Second-class midshipmen may have a car but must maintain and operate it beyond academy grounds.
- First-class midshipmen may drive a car in Annapolis and on board the Naval Academy and may park at the academy.
- No midshipman is allowed to maintain or operate a motorcycle within town liberty limits.

Alcohol and Drugs

As a future naval officer, you learn at the Naval Academy to drink in a responsible way, if at all, and to shun illegal drugs entirely. Normally, plebes are not allowed to consume alcoholic beverages except when of legal age and on leave away from the academy. As an upperclass midshipman, you may drink if you are the minimum legal age for drinking in the state, 21 in Maryland. The use of illegal drugs is strictly forbidden and results in expulsion from the academy. As a midshipman, you are subject to random drug testing through urinalysis, consistent with Navy-wide policies and procedures.



The difference between a moral man and a man of honor is that the latter regrets a discreditable act, even when it has worked and he has not been caught.
—HENRY L. MENCKEN



Services

Almost everything you need as a midshipman is available on the academy grounds. There's a bookstore, uniform and tailor shop, cobbler shop, snack bar, barber/beauty shop, post office and recreation rooms. We also provide the following services:

Recreational Facilities

The Naval Academy has a wide variety of activities which are available to midshipmen. Located in historic Dahlgren Hall are the Drydock Restaurant and the ice skating rink—home of the Navy hockey team. The Steerage Restaurant is located in Bancroft Hall.

Dining

The entire brigade eats at one time in a 55,000-square-foot dining area or wardroom, King Hall. Companies sit together, and food is served family style for breakfast and lunch, Monday through Friday, and on Sunday night dinners. All other meals are served buffet style. The typical daily diet adds up to about 4,000 calories and includes such dishes as steak, spiced shrimp, Mexican cuisine and home-baked pastries. All of the food for the 12,000 meals served daily is prepared by our food service staff in the kitchens adjacent to King Hall.

Medical Care

Modern facilities for medical treatment are conveniently located at the Naval Academy. Besides routine medical treatment, orthopedics/sports medicine, podiatry, physical therapy, gynecology and preventive medicine and optometry services are available. Specialists in dermatology, neurology, cardiology and urology schedule visits to the academy. Consultation and treatment including inpatient care, in all major medical and surgical specialties are available at the National Capital Area military treatment facilities. However, most orthopedic procedures and emergency conditions are referred to Anne Arundel Medical Center, a fully accredited civilian facility in Annapolis.

Dental Care

Comprehensive oral health care is provided by the Dental Clinic conveniently located in Bancroft Hall. The professional staff provides the full range of dental hygiene and general dentistry treatment. The specialties of Oral Surgery, Orthodontics (limited), Periodontics and Prosthodontics are also available.

Midshipmen Development Center

A wide variety of training, educational and clinical services are provided to promote and enhance the adjustment, well-being, and professional development of midshipmen, including confidential individual and group counseling, workshops and support groups.

Legal assistance

The Office of Legal Counsel is available to assist midshipmen with personal and military legal questions.

Financial advice

Regular seminars offer information on savings, loans, insurance programs, investment opportunities and tax returns. Individual financial counseling is available from a Navy Supply Corps officer who serves as midshipmen financial advisor.



The task of leadership is not to put greatness into humanity, but to elicit it, for the greatness is already there.

—JOHN BUCHAN







The relationship between officers and men should in no sense be that of superior and inferior nor that of master and servant, but rather that of teacher and scholar.

— GENERAL JOHN A. LEJEUNE, USMC

Academic and Professional Education

To prepare midshipmen as Naval officers, the Naval Academy's curriculum blends professional subjects with required and elective courses similar to those offered at leading civilian colleges. Our curriculum has three basic elements:

- core requirements in engineering, natural sciences, the humanities and social sciences, to assure that graduates are able to think, solve problems and express conclusions clearly;
- core academic courses and practical training to teach the professional and leadership skills required of Navy and Marine Corps officers; and
- an academic major in a subject chosen by midshipmen to develop their individual interests and talents.

Accreditation

The Naval Academy is accredited by the Commission on Higher Education of the Middle States Association of Colleges and Schools, 3624 Market St., Philadelphia, PA 19104, (215) 662-5606. The Commission on Higher Education is an institutional accrediting agency recognized by the U.S. Secretary of Education and the Commission on Recognition of Post-secondary Education. In addition, six of the Naval Academy's engineering majors are professionally accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology. The computer science major is accredited by the Computer Science Accreditation Commission of the Computing Sciences Accreditation Board, and the chemistry major is accredited by the American Chemical Society.

Degree Awarded

Upon graduation, a bachelor of science degree is awarded regardless of major, because of the technical content of the core curriculum. Those in the top 10 percent of their class graduate with distinction. Those who have completed special honors programs in one of six selected majors graduate with honors.

Educational Philosophy

The Naval Academy's philosophy of education stresses attention to individual students by highly qualified faculty members who are strongly committed to teaching. It's hard to get lost in the classroom at the Naval Academy. Classes are small, with an average size of fewer than 18 students. Even the core courses required of all midshipmen are divided into small sections. Midshipmen receive individual attention from instructor. In science and engineering courses, the same professor who lectures in the classroom supervises experiments in the lab. This contrasts sharply with most universities, where scholars may address their students in huge lecture halls, but direct contact with undergraduates in labs or discussion sections is delegated to graduate assistants. All courses at the Naval Academy are taught and graded by faculty members, not by graduate assistants.

Dean William Miller returned to his alma mater as the sixth Academic Dean and Provost in October 1997; he is the chief academic officer at the Naval Academy. Dean Miller graduated from the Naval Academy in 1962 and, during his 31-year Navy career, served as a Surface Warfare Officer and a leader in the Navy's research and development programs. As a surface warfare officer, Dean Miller commanded a frigate and a destroyer. As a researcher, Dean Miller served as the Chief of Naval Research, Commanding Officer of the Naval Research Laboratory, and founding director of the Navy's Low Observables (stealth) Technology office. After retiring from the Navy, Dean Miller served from 1993 to 1997 as the Associate Provost for Research and Economic Development at West Virginia University where he co-founded the Benedum Center for Education Reform and the Institute for Software Research. He holds masters and doctor of philosophy degrees in Electrical Engineering from Stanford University.



"The Naval Academy has a long, proud tradition of educating and training leaders for the greatest challenges of national service. We prepare our graduates to lead the nation's sailors and Marines immediately upon graduation. We also provide a firm foundation of knowledge at the baccalaureate level on which our graduates can later build the specific expertise they will need for their career progression. The careers on which Naval Academy graduates embark demand individuals who can think critically, analyze complex problems, speak and write articulately, and faithfully support the values of their service and their nation.

The foundation of the academic program at the Naval Academy is our core curriculum. Taught by one of our nation's finest undergraduate faculties in first class facilities, the core curriculum ensures all graduates receive a comprehensive, intellectually challenging education which prepares them to tackle a diverse array of complex problems. It is in our core curriculum that midshipmen develop the professional competence necessary for any of our graduates to succeed in any available career field in the Navy or Marine Corps.

The Naval Academy also offers each midshipman a selection of 18 majors in disciplines as diverse as engineering, math, the physical sciences, the humanities and the social sciences. Each of these majors contributes to the development of a strong educational foundation necessary for our graduates to excel in their immediate responsibilities and in future studies. Some majors have been rated by independent national authorities as among the best of their discipline in the country.

Most importantly, in the Naval Academy's academic program, we seek not only to educate our midshipmen, but to substantially contribute to the development of their character. Through consistently high standards of performance, a demanding curriculum and a stimulating learning environment, we develop leaders characterized by self-discipline, initiative, determination and a commitment to life-long learning. The academic program complements the professional training, character development and the physical education components of the Academy program to produce these critical leadership qualities. With its comprehensive core curriculum, outstanding majors program, and emphasis on character development, I believe the Naval Academy is producing outstanding leaders for tomorrow and the next millennium."

Faculty

Our 600-member faculty is an integrated group of officers and civilians in nearly equal numbers. This composition is unique among service academies. It dates from the earliest days of the Naval School when three civilian teachers joined four Navy officers in the first faculty in 1845. Officers rotate to the Academy for two-to-three-year assignments, bringing fresh ideas and experiences from operational units and staffs of the Navy and Marine Corps. They can also explain how studies at the Academy are applied in the fleet and the field. A small cadre of officer faculty who have doctorates add another dimension to the teaching staff as Permanent Military Professors. The Academy's civilian faculty members give continuity to the educational program and form a core of professional scholarship and teaching experience. Nearly all of these civilians have doctoral degrees, and many of them are recognized as leading scholars in their fields. Working together closely, these military and civilian faculty members form one of the strongest and most dedicated teaching faculties of any college or university in the United States. Although many faculty members are involved in scholarly research and writing, their first priority always is teaching.

Faculty Senate

Founded in 1993 as a consolidation of two earlier faculty organizations, the United States Naval Academy Faculty Senate's primary purpose is to advise the administration on faculty and curriculum matters. With a membership of approximately 30, the Senate is composed of representatives, both military and civilian, from the various academic departments and divisions. Typically, the Senate meets twice a month during the academic year, conducting most of its business based on reports from the various committees and subcommittees.

An important goal of the Senate is to improve Yard-wide communication. As a result, senior Academy administrators are ex-officio members of the Senate, addressing the membership on issues of major concern.

Academic Advising

Midshipmen receive as much help as they need in planning their academic programs. The academic advising system has two stages. During Plebe Summer each company of plebes is assigned a faculty member, either military or civilian, to act as its adviser. Each plebe receives academic counseling including basic study skills information prior to the commencement of the academic year. Advising continues throughout the year as often as necessary. When a major is selected in the spring of plebe year, midshipmen are assigned a permanent faculty adviser from the academic department of that major. Professors and company officers are extremely helpful in providing academic counseling and advice to midshipmen.



Let us think of education as the means of developing our greatest abilities, because in each of us there is a private hope and dream, which, fulfilled, can be translated into benefits for everyone, and greater strength for our nation.

—JOHN F. KENNEDY





Core Curriculum

In four years at the Naval Academy, you are required to take certain core courses to make sure you are well prepared for the major career-path options available to Navy and Marine Corps officers. Majors courses also prepare you for advanced professional training and postgraduate education, which are expected of nearly all naval officers. Through required courses in engineering, natural sciences, social sciences, the humanities, professional military subjects and physical education, the Naval Academy gives midshipmen a balanced education to open practically any door of opportunity in the future.

During plebe or freshman year, nearly all courses are required. The required courses form the foundation for the more advanced courses chosen by upperclass midshipmen. Some core requirements in the upperclass years have alternative courses from which to choose, depending on your academic background, abilities and major.

The typical academic schedule for plebes includes five courses in each of two semesters:

Plebe year, first semester — 16 credit hours

- Calculus I — Most begin here, some validate and are placed into later calculus courses and a few plebes not adequately prepared for calculus take a pre-calculus course that does not count as part of the minimum mathematics requirement.
- Chemistry I — Including laboratories.
- U.S. Government and Constitutional Development — The foundation of American democracy.
- Leadership and Human Behavior — An examination of the fundamentals of leadership within the context of individual and group behavior.

- Rhetoric and Introduction to Literature I — Some plebes take a practical writing course to prepare for this class.

Plebe year, second semester — 18 credit hours

- In addition to these courses taken for credit, a few hundred plebes who have had little exposure to computers are provided with six weeks of training.
- Calculus II — Continuation of the first-semester course.
- Chemistry II — Continuation of the first-semester course.
- American Naval Heritage — A history of this country's Navy.
- Fundamentals of Naval Science — The basic elements of shipboard operation, organization and propulsion.
- Rhetoric and Introduction to Literature II.

Advanced Placement

More than half of those entering the Naval Academy validate one or more courses. Each of the academy's academic departments sets its own validation standards and considers one or more of the following:

- transcripts;
- department validation tests, administered at the Naval Academy; and
- College Entrance Examination Board Achievement and Advanced Placement tests.

During Plebe Summer, all entering midshipmen take placement exams in English, mathematics and science. Individual midshipmen may elect to take placement exams in other discipline areas such as chemistry, economics, history, physics, political science and foreign languages. Excellent performance on the placement exams may result in a midshipman validating courses and thus accelerating portions of their academic program. Over four years, this may permit the student to reduce the number of courses taken in a particular semester, become eligible for special academic programs, for honors programs and graduate programs. It may allow a student to complete a minor, or take courses that might not otherwise fit into the standard academic schedule.

Most placement exams are scheduled during the first two weeks of Plebe Summer. Midshipmen should arrive at the Naval Academy prepared to take these very important examinations. Following the evaluation of the exam results, each plebe will receive academic counseling from a faculty adviser to help the student understand his or her performance on the examination and subsequent placement in a particular level or section of a course.

In any case, midshipmen must take a minimum of 15 credit hours each semester and spend a total of four years in residence at the Naval Academy to complete professional courses and training.



*Science has its being
in a perpetual mental
restlessness.*

—WILLIAM TEMPLE



Majors Program

The Naval Academy is strongly oriented toward science and engineering; and the majority of graduates are engineers or technical majors. For those students with backgrounds or overriding interests in other fields of study, a broad majors program in those social sciences and humanities that can be reasonably related to the naval profession is offered.

Near the end of plebe year, you choose a major course of study with the aid and support of academic and military advisers. A total of 18 majors is offered:

Aerospace Engineering	Mathematics
Chemistry	Mechanical Engineering
Computer Science	Naval Architecture
Economics	Ocean Engineering
Electrical Engineering	Oceanography
English	Physics
General Engineering	Political Science
General Science	Quantitative Economics
History	Systems Engineering

Learning without thought is labor lost; thought without learning is perilous.

—CONFUCIUS

Some of these areas offer additional specialization within the major. For example, recognizing that the Navy is an important user of space vehicles and satellites, the Naval Academy created an astronautics track within the aerospace engineering major to help prepare midshipmen for assignments with the Navy Space Command and NASA. Minors in French, German, Spanish, Russian and Japanese are offered to those who complete four advanced courses in one of these languages while at the Academy.

Special Academic Opportunities

Students who excel at the Naval Academy have many opportunities to challenge and advance themselves through several special programs.

Trident Scholars

The Trident Scholar Program provides an opportunity for exceptionally capable midshipmen to engage in independent study and research during their senior year. Following their



selection to the program during their junior year, the first class scholars conduct independent research in an area of interest, working with a faculty advisor who is an expert in the field. Trident Scholars carry a reduced formal course load to give them time for in-depth research of the project and for preparation of a thesis. Recent Trident Scholar projects have included research on "Tracking Near-Earth Asteroids", "Computational Study of Wing Drop on the F/A18E Super Hornet Aircraft in the Power Approach Configuration," and "Multiple Aperture Camera System."

Honors Program

Midshipmen with excellent academic and leadership performance can apply for honors programs offered in history, English, political science, mathematics, oceanography and economics. Honors students complete a thesis or research project and orally defend it before a panel of faculty members. Successful participants graduate with honors.

Voluntary Graduate Education Program (VGEP)

Midshipmen who have completed academy course requirements early through any combination of validation and overloading can compete for selection and begin work toward master's degrees at nearby civilian universities, such as Johns Hopkins and the University of Maryland. Up to 20 midshipmen can participate annually, starting graduate work during first-class (senior) year and completing their master's degree programs within seven months after graduation from the Naval Academy. Fields of study are selected from Navy-approved graduate education programs leading to Navy subspecialty qualification.





*All that mankind has done,
thought, gained, or been: it
is lying as in magic preserva-
tion in the pages of books.*

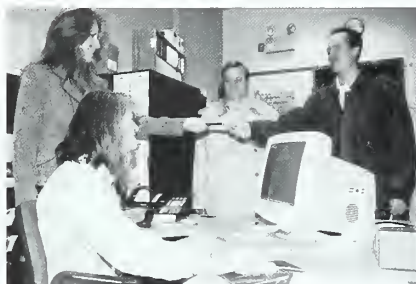
—THOMAS CARLYLE

Facilities

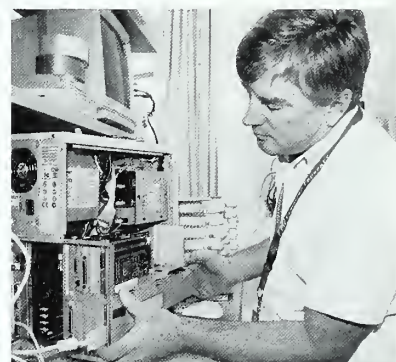
From wind tunnels to a sub-critical nuclear reactor, we have outstanding facilities and equipment in every phase of our program. Classrooms, labs and athletic facilities provide modern and comfortable areas for learning and recreation.

The following are only some of the special academic facilities available:

- propulsion lab
- wind tunnels, both subsonic and supersonic
- 120-foot and 380-foot towing tanks
- coastal engineering basin
- environmental chamber facilities
- sub-critical nuclear reactor
- oceanographic research vessel, field laboratory and weather station
- 16-inch Cassegrain reflector telescope
- fully-equipped laboratories for chemistry, physics, engineering, oceanography and foreign language courses
- 12-meter satellite earth station



Computers



The United States Naval Academy has been an educational leader in the use of computer technology since the 1960s. *Today it is considered one of the most wired, advanced, and forward-looking information technology campuses in the nation*, highlighted by a system of multimedia (voice, video, and data) networks. A fiberoptic, scalable, highspeed enterprise backbone, with a system of tailored virtual local area networks (VLANS), is dedicated to every building, office, conference room, classroom, and laboratory. This network also supports Bancroft Hall, the midshipmen's dormitory. Literally, hundreds of miles of fiber, copper, and coax wiring posture our networking with unlimited expansion capability. It provides Intranet and Internet access, multi-media capabilities, thin client applications, intelligent tools, and reliable integrated desktop technologies, on demand, to support teaching and learning, research, and social use. All 1,950 midshipmen rooms are fully networked supporting 24x7 video and data communications to each midshipman desk. Midshipmen are well equipped to profit from this environment. Prior to the beginning of their first academic year, all plebes receive an advanced full multimedia desktop microcomputer with a suite of communications, administrative, and academic software. The Naval Academy considers information technology to be a mission critical resource, a strategic initiative, and a core competency. Consequently it is embedded in every USNA function with all user driven IT products and resources.

All midshipmen must purchase a Naval Academy-specified personal desktop microcomputer and software during Plebe Summer. After introductory training, midshipmen use their personal computer in most academic courses and professional development.

Writing Center

Open to all midshipmen, the Writing Center exists to help those needing extra writing instruction. The Writing Center is staffed by English department faculty members, both civilian and military, who are experts in composition and in working with students to improve their writing skills.

Math Lab

The Math Lab is available to midshipmen to supplement meetings with their own instructors. Staffed with faculty members of the Mathematics Department, the Math Lab provides assistance in all core mathematics courses to midshipmen without prior appointments throughout the academic day.

Academic Center

All midshipmen have access to the Academic Center, which offers academic advising services and learning skills classes. Students who encounter academic difficulty during plebe year are referred to the Academic Center where they receive special academic advising, academic effectiveness classes and tutoring. A series of learning skills classes, including topics such as time management, note taking, effective reading, test taking and how to cope with challenges, is offered several times a year for interested midshipmen. The Academic Center coordinates the Plebe Advising Program where faculty members serve as the advisors for a company of plebes during both plebe summer and academic year.

Midshipmen Group Study Program (MGSP)

MGSP provides an opportunity for midshipmen to study with others taking the same course, to compare notes, to discuss important concepts, and to develop strategies for studying. Groups are directed by midshipmen who have done well in the course and are trained in leading others. The program provides assistance in Chemistry (SC111, 112), Calculus (SM005, 121, 122, 131, 161, 221, 223), Physics (SP211, 212), and Statics/Dynamics (EM211, 232).

Nimitz Library

Built in 1973, the library offers more than half a million volumes, with a special emphasis on naval science and history. Comfortable reading and study areas can accommodate 1,500 students. The library also contains seminar and group-study rooms, audio carrels and a computer terminal room. Through Nimitz Library, midshipmen have access to other libraries in the Washington and Baltimore areas.

Multimedia Support Center

The Multimedia Support Center (MSC) is the Naval Academy's audiovisual service. Midshipmen and faculty freely use the services of MSC to enhance teaching and learning at the academy. MSC's facilities include a graphics studio that can enhance any classroom presentation; equipment loan; videotape and audiotape loans (almost 3,000 titles); a production studio; and a closed-circuit television distribution system.

*A page of history is worth
a book of logic.*

—VICE ADMIRAL HYMAN
RICKOVER



Resources Afloat

The fundamentals of seamanship, navigation and naval operations are taught in laboratories afloat on our many sail and power craft. The Robert Crown Sailing Center on the Severn River supports many of these activities, as well as recreational, intercollegiate and offshore sailing. The Naval Academy's large and varied fleet includes:

- 20 108-foot yard patrol craft;
- 16 IMCO sailboards and 20 Funboards;
- 100 Lasers;
- 24 420 dinghies;
- 20 FJ dinghies;
- 30 24-foot Rainbow-class knockabouts;
- 12 J-24s;
- 20 44-foot sloops; and
- ten 40- to 60-foot offshore sail training craft.

The Naval Academy's sailing program is truly comprehensive. It ranges from basic instruction to advanced intercollegiate dinghy and international-level, open-ocean racing. All midshipmen participate in sailing during Plebe Summer in 24-foot knockabouts, Lasers, and 44-foot sloops.

After Plebe Summer, midshipmen may take part in advanced training under sail and recreational or competitive sailing. Both the Naval Academy's varsity sailing programs and its intercollegiate and off-shore/ocean "big boat" racing programs are consistently top-ranked nationally.

*To reach the port of Heaven,
we must sail, sometimes with
the wind and sometimes
against it—but we must
sail and not drift or lie
at anchor.*

—OLIVER WENDELL
HOLMES



Professional Courses and Training

Professional courses and training are an important part of the Naval Academy's integrated program. Required courses in such areas as naval science, engineering, navigation and weapons systems give you a working knowledge of modern naval operations and technology. Courses in leadership, ethics and military law help prepare you for leadership responsibilities as an upperclass midshipman and a commissioned officer. Physical education teaches you the value of physical fitness and staying fit for life. Eight weeks of annual summer training introduces you to operational units of the Navy and Marine Corps, life at sea and the responsibilities of a junior officer.

Courses available as electives include leadership and psychology. Also available are extracurricular programs such as the Yard Patrol Craft Squadron and the Command Seamanship Training Squadron (CSTS).

Academic Year Courses and Training

Fourth Class (Plebe) Year

Professional courses — two required introductory classes in naval science and leadership. Courses include classroom studies and lab sessions in operational trainers and afloat in yard patrol craft.

Infantry drill — about 13 hours of infantry drill in the fall and spring, including four hours in the Brigade of Midshipmen dress parades.

Physical education — the Physical Education Department is tasked with accomplishing one third of the mission of the Naval Academy, to prepare midshipmen physically to become professional Navy and Marine Corps officers. This mission is accomplished through a thorough and rigorous course of instruction in the fundamentals of swimming, personal defense, lifetime fitness and recreational sports, and through the regular administration of the Physical Readiness Test. Midshipmen must meet physical education requirements during their four years at the Naval Academy in order to graduate. The following is required for plebes:

- Swimming — 100-meter crawl stroke; 50 meters using the breaststroke and elementary backstroke (seven to 11 strokes per 25 meters); 5-meter tower jump; 40-foot underwater swim; 200-meter swim (five minutes, 12 seconds maximum).
- Weight training – acquire fundamental knowledge and skills to pursue strength training for the purpose of achieving maximum strength and flexibility.
- Personal Conditioning - fundamental knowledge for a lifetime of physical fitness.

Third class year

Professional courses — three required in navigation, naval engineering, ethics and moral reasoning

Infantry drill — about 13 hours in the fall and spring, including dress parades.



*Ours is a maritime nation,
requiring the most powerful
navies to protect our free
rights to the farthest reaches
of the seas.*

—LYNDON B. JOHNSON

Physical Education

- Swimming — 400-meter swim (11 minutes maximum); 50-meter sidestroke (seven to 11 strokes per 25 meters); 10-meter tower jump; clothing (trouser) inflation in three minutes; 50-foot underwater swim fully clothed.
- Boxing — midshipmen are awarded grades based on proper form, offensive and defensive techniques, fortitude and ring craft during a competitive bout against an opponent of the same size, experience and gender.
- Wrestling — midshipmen are awarded grades based on take-downs, rides, pins, escapes, reversals and aggressiveness during a competitive wrestling bout against an opponent of the same size, experience and gender.

Second class year

Professional courses — five are required, including courses in strategy and tactics, naval engineering and weapons. Also required are naval electricity and electronics and a leadership course that focuses on the dynamic interactions of leader, followers, and situation.

Infantry drill — about 13 hours in the fall and spring, including dress parades.

Physical education

- Swimming — tower jump (five-, 7.5-, or 10-meters); one-half to one mile swim in 40 minutes, fully clothed. Clothing (trousers only) inflation in two minutes.
- Judo — midshipmen are awarded grades based on demonstrated skills in falling, throwing and grappling through the martial art of leverage. Competitive judo bouts are graded.
- Electives — opportunity to acquire skills in a lifetime carry-over activity (20 electives).

First class year

Professional courses — the three required courses are a weapons course exploring warfare systems design, a law course covering military justice and the law of war, and a junior officer seminar.

Infantry drill — leading the brigade in about 13 hours of drill, including dress parades.

Physical education

- Electives — opportunity to acquire skills in a lifetime carry-over activity (20 electives).

In addition to the above requirements, all midshipmen are regularly required to pass the Physical Readiness Test. The PRT consists of push-ups, curl-ups, and a 1.5 mile run. The PRT is administered each semester all four years. 1.5 mile run — maximum time for men: 10:30. Maximum time for women: 12:40.

Physical Readiness Test (push-ups, sit and reach, and curl-ups) — Men: minimum to pass in two minutes; 40 push-ups, 65 curl-ups. Women: minimum to pass in two minutes;

It cannot be too often repeated that in modern war, and especially in modern naval war, the chief factor in achieving triumph is what has been done in the way of thorough preparation and training before the beginning of war.

—THEODORE ROOSEVELT



18 push-ups, 65 curl-ups (sit-ups). Sit and reach, touch toes in sitting position. Electives are offered in 20 lifetime carryover sports/activities: badminton, box aerobics, first aid, fitness, golf, water polo, racquetball, squash, tennis, volleyball, kayaking, gymnastics, softball, basketball, lacrosse, weight training, hand-to-hand combat, soccer and swim conditioning. All physical education subjects are graded, and midshipmen must pass all subjects in order to graduate.

Summer courses and training

Plebe summer

This starts on Induction Day early in July. Areas of emphasis include military indoctrination, physical education, basic seamanship and sailing, small arms training, first aid and introduction to personal computers. See page 42 for more on plebe summer.

Third class summer

In the summer between your plebe and third class years, you will go to sea for three weeks in Yard Patrol craft to various New England ports. Additionally, you will spend three weeks in either 44-foot Naval Academy sailing sloops or participating in naval tactical training, which include simulating SEAL and Marine Corps operations and receiving an indoctrination to the joint military arena.

Second class summer

During the summer before your second class year, you are introduced to every major branch of the Navy and Marine Corps. In one action-packed summer, you fly Navy aircraft at Pensacola, dive in a nuclear-powered submarine off the coast of Florida, and patrol, infiltrate and attack mock enemy positions in the forests of Virginia with the Marine Corps. You and your classmates will also report to Navy ships and submarines around the world for second class cruise. You become part of the crew for four weeks, taking part in drills, gunnery exercises and standing watches underway. This experience gives you first-hand knowledge of the daily routine of the Navy at sea. You also learn to appreciate the talents, responsibilities and perspectives of the enlisted men and women you will later lead as an officer.

First class summer

In the final summer, you get the chance to put your leadership skills to the test, both in the fleet and at the academy. For four to eight weeks, you join a Navy or Marine Corps operational unit, and this time your duties are those of a junior officer. Depending on your career interests and qualifications, you can choose a surface warship, submarine, aircraft carrier, or aviation squadron. Those midshipmen interested in choosing the Marine Corps after graduation may attend a four-week officer candidate course in Quantico, Va., with a follow-on four-week tour attached to a Fleet Marine Force unit. Selected midshipmen may also participate in a four-week internship in a wide variety of disciplines.

Other summer training opportunities

The academy also offers summer school. Midshipmen may enroll in concentrated versions of regular classes to make up for previous unsatisfactory performance or to get ahead in curricular requirements. These classes are taken in lieu of summer leave.

The Captain Marshall H. Cox/Captain A.H. Gaubart Fund supports summer travel and language study abroad by midshipmen and newly commissioned Naval Academy graduates. Programs are offered in Russian, Japanese, Spanish, French and German.



*The more you sweat in
peace, the less you bleed
in war.*

—CHINESE PROVERB



*Honor is like an island,
rugged and without a beach;
once we have left it, we
can never return.*

—NICOLAS BOILEAU-
DESPRIANT

Character Development

The academy has a deep and abiding commitment to the moral development of its midshipmen and to instilling the Naval service core values of honor, courage and commitment. The goal of the character development division is to integrate the moral, ethical and character development of midshipmen across every aspect of the Naval Academy experience. The integrated character development program is the single most important feature that distinguishes the Naval Academy from other educational institutions and officer commissioning sources. Elements of the character development program include:

- *Admission Candidate Statements and Recommendations.* Candidates for admission are required to write an essay on a significant character-developing experience that they have had, and teachers completing recommendations for candidates are specifically asked to comment on the character and integrity of candidates as compared to their peers.
- *Plebe Summer Training.* Fourteen hours of training during Plebe Summer lay the foundation for character development as a midshipman. Eight honor lessons are presented on topics such as moral courage, integrity and loyalty, the meaning of honor, and the basic mechanics of the honor system. Six human relations classes address issues such as discrimination, conflict resolution, stress management, alcohol abuse and sexual assault prevention. Plebe Summer culminates with an Honor Affirmation ceremony, during which plebes formally affirm their allegiance to the Honor Concept and Honor Treatise of the Brigade of Midshipmen during Parents' Weekend. During this moving ceremony, the plebes also reaffirm their oath of office as midshipmen.
- *Four-Year Honor Education Plan.* Midshipmen-taught Honor Education lessons, building on the groundwork of Plebe Summer training, are given each year to all midshipmen. Lessons progress from the procedural aspects of the Honor System in plebe year, to honor in writing fitness reports and honorable conduct in combat during First Class year.
- *Honor Remediation Program.* A few midshipmen each year who are found guilty of honor offenses are retained by the Commandant and assigned to a comprehensive honor remediation program. This program places the midshipman under the mentorship of a senior officer for a designated period, usually three to four months. This introspective period requires regular readings and personal reflection on honor, extensive discussions with the mentor, participation in a community service project, and preparation of a written thesis.



- *Midshipmen Development Seminars (MDS)*. Once each month, third and fourth class midshipmen are divided into small groups for a 60-minute training/discussion on a general military related or honor topic. These seminars are designed to provide initial training or reinforce the expected behavior of a midshipman and an officer; topics include: fraternization, alcohol, respect and dignity, personal responsibility, lying, living honorably and honor vs loyalty. These seminars, led by trained staff and faculty facilitators and first class midshipmen, typically focus on case studies and supporting articles.

- *Character Development Seminars (CDS)*. Once each month, first and second class midshipmen are divided into small groups for a 60-minute ethics-related discussion designed to strengthen the foundations of moral values and to nurture ethical and moral reasoning skills. These seminars, led by trained staff and faculty facilitators and first class midshipmen, typically center around readings from ethics texts and articles. There are 240 staff and faculty members who voluntarily facilitate in the MDS and CDS programs.

- *Human Education Resource Officer (HERO) Program*. This peer-education and peer-resource human relations network places specially trained midshipmen trainers and advisors for each class in each company. The program is designed to provide support to the chain of command in all human relations areas, resolve peer issues within the companies, and provide education and information to midshipmen that will help them make responsible decisions in their own lives, and to contribute to an environment of dignity and respect for others within the Brigade.

- *Core Ethics Course*. A new core course, NE203: *Moral Reasoning for Naval Leaders*, is designed to strengthen the midshipman's background in the foundations of ethical thought and moral reasoning and is the academy's flagship academic course. Given in the third class year, the course is team-taught by civilian philosophers from the Department of Leadership, Ethics and Law and senior military officers from across the Yard. NE203 is a three-credit-hour course; one hour each week consists of a lecture on ethical theory, with two hours of small group discussion and case studies on applied ethics. A sponsored Chair for a nationally-renowned ethicist has been endowed for the purpose of reviewing and developing curriculum efforts in this area.

- *Character Development Speakers Program*. Annually, the division invites prominent speakers and experts in character development to address the Brigade or to provide additional specialized training to faculty, staff and midshipmen. During Plebe Summer, the Naval Service Core Values Speakers Program enables the new class to interact with such prominent leaders as the chief of naval operations, and the commandant of the Marine Corps. Throughout the year, the division sponsors training seminars and speakers. Past speakers have included Dr. Rushworth Kidder, president of the Institute for Global Ethics, Mr. Michael Josephson of the Josephson Institute for Ethics, Mr. Bob Davis of the Institute for Managing Diversity, and representatives of the Defense Equal Opportunity Management Institute (DEOMI). Dr. Kidder, Mr. Josephson and DEOMI also provided several day-long seminars in character development to IDS facilitators, staff and faculty and midshipmen.

- *Ethics-Across-the-Curriculum*. This program ensures that the Academy's core courses in English, history, political science and naval leadership contain strong ethical components. Many of the majors' courses have also added ethical segments. One of the goals in this academy-wide effort is to impress upon the midshipmen that there are no areas or academic courses where ethics does not in some way come into play.



*Every man's character is
the arbiter of his fortune.*
—PUBLIUS SYRUS

Grading

Grades have an added dimension at the Naval Academy in that they affect your status and privileges as a midshipman. As the major determinant of class rank, they also influence ship selection or advanced training scheduling following service assignment and seniority upon graduation and commissioning.

We use a letter grading system with these values, called quality point equivalents, or QPE:

A	=	4.0 (Excellent)
B	=	3.0 (Good)
C	=	2.0 (Satisfactory)
D	=	1.0 (Marginally passing)
F	=	0.0 (Failing)

Grades are averaged using a weighted semester hour system called the quality point rating or QPR. Your QPR is figured by multiplying the QPE received in each course by the semester hours of credit for the course. That total is divided by the total number of hours completed in the semester. You earn semester QPRs and a cumulative QPR (CQPR) based on all of your grades.

Midshipmen must maintain a cumulative QPR of 2.0 or above or they risk academic probation or dismissal. As required by law, the Academic Board reviews the records of academically deficient midshipmen. Midshipmen subject to academic discharge are those who fail two or more courses; have a semester QPR below 1.5; fail to remove academic probation; are two or more courses behind in the matrix of the assigned major; do not fulfill a requirement previously assigned by the academic board; or do not complete all graduation requirements by the end of the first-class year.

Grades in military performance, conduct, physical education and summer professional training are not included in the QPR, but they are figured into class standing. Satisfactory performance in professional areas is required.

Recognition of Excellence

Three honor categories recognize midshipmen with outstanding academic and professional records:

Superintendent's List — midshipmen with semester QPR of at least 3.4 and no grade of D, F, I; grades of A in military performance, A in conduct and A or B in physical education.

Dean's List — midshipmen not on the Superintendent's List with semester QPR of 3.4 and no grade of D, F, I in any academic course; grades of at least a B in military performance, B in conduct and at A, B, or C in physical education.

Commandant's List — midshipmen with semester QPR of at least 2.9, grades of at least B in military performance, A in conduct and B in physical education.

Virtue, though she gets her beginning from nature, yet receives the finishing touches from learning.

—QUINTILIAN



Honor societies

A number of national scholastic honor societies are represented at the Naval Academy. Midshipmen who excel academically may be recommended for membership in these societies:

Omicron Delta Epsilon — international honor society for economics. Midshipmen candidates for election to the Naval Academy chapter need not be economics majors but must have an overall scholastic average of B and at least twelve credits in economics with a B average or better.

Phi Alpha Theta — international honor society for history. Membership includes both faculty and students who participate in forums and seminars, also hosting guest speakers and regional meetings of the society.

Phi Kappa Phi — for superior scholarship in all fields of study. Up to six percent of the midshipmen of each class may be chosen to join, half during their second-class year and half in first-class year.

Pi Sigma Alpha — national honor society for political science. To be eligible for membership, midshipmen must stand in the upper one-third of their class with a B or better average in at least 15 hours of political science courses.

Phi Sigma Iota — international honor society for foreign languages. To be eligible for membership, midshipmen must have an overall B average, a B average in foreign language courses and have completed advanced courses in foreign languages.

Pi Tau Sigma — national mechanical engineering honor society. Midshipmen majoring in mechanical engineering who stand in the upper third of their class as seniors or the upper fifth as juniors are eligible for membership.

Sigma Pi Sigma — physics honor society, affiliated with the American Institute of Physics and the American Association for the Advancement of Science. Midshipmen candidates for membership must have completed three semesters of physics with at least a B average and must be in the upper one-third of their class in general scholarship.

Sigma Tau Delta — national English honor society. To be eligible for membership, midshipmen must be in the upper third of their class with at least a B average in advanced English courses.

Sigma Xi — scientific research society that encourages original investigation in the fields of pure and applied science. The Naval Academy chapter includes members from the professional staffs of the academy and the Annapolis laboratory of the Naval Surface Warfare Center.

Tau Beta Pi — national engineering honor society. The top fifth of senior engineering majors and top eighth of junior engineering majors are eligible for membership.

Upsilon Pi Epsilon — international honor society for the computing sciences. To be eligible for membership, midshipmen must have a minimum of a 3.0 QPR overall and a 3.25 QPR in computer science courses.



The reward of a thing well done is to have done it.
—RALPH WALDO EMERSON

Graduation Requirements

To be eligible to graduate, you must:

- complete at least 140 academic credit hours, including core requirements in engineering, natural sciences, humanities and social sciences;
- complete the courses required in your chosen major;
- achieve a final cumulative quality point rating (CQPR) of at least 2.0, a C average;
- meet required standards in professional studies and at-sea training;
- meet required standards of military performance, conduct, honor and physical education; and
- accept a commission in the Navy or Marine Corps, unless one is not offered due to physical disqualification.

Under all circumstances, a decisive naval superiority is to be considered a fundamental principle, and the basis upon which all hope of success must ultimately depend.

—GEORGE WASHINGTON

Awards

Outstanding midshipmen are recognized publicly during Commissioning Week. A number of organizations and individuals sponsor more than 80 prizes and awards honoring midshipmen for excellence in academics, professional studies, leadership, athletics, sailing, debate and public speaking.





Advanced Education

Postgraduate education is encouraged for all naval officers and is practically a requirement in today's Navy and Marine Corps, which operate very sophisticated systems in a changing, complex world. Nearly all graduates go to advanced professional training en route to their first duty assignments. New Marine Corps officers go to The Basic School at Quantico, Va. Navy ensigns go to surface warfare officer school, nuclear power school, flight training or other schools, depending on their chosen specialty and the nature of their first assignment. Professional training continues throughout your career.

There also are several ways for Naval Academy graduates to earn advanced academic degrees besides the Voluntary Graduate Education Program (VGEP) discussed on page 59. Most officers are automatically considered for graduate school as they complete their first duty assignment. If selected, they can enter master's degree programs at the Naval Postgraduate School in Monterey, Calif., or at an approved civilian university. Midshipmen with outstanding academic records can compete for a number of scholarships for postgraduate school right after graduation from the Naval Academy or after an initial operational assignment. There's also a program for up to 15 graduates a year who want to combine careers in medicine and the Navy. To prepare for this program, midshipmen usually major in chemistry and then enter civilian or armed forces medical schools soon after graduation and commissioning.

The following graduate education programs are currently available:

Navy Burke Program (Junior Line Officer Advanced Educational Program) — open to 15 qualified graduates in each class for study toward a master's degree in science or engineering. These studies, usually at the Naval Postgraduate School, begin after one operational tour of two to four years.

No sane man is unafraid in battle, but discipline produces in him a form of vicarious courage.

—GENERAL GEORGE S. PATTON, JR.

Marine Corps Burke Program — open to 15 graduates from each class who enter the Marine Corps. Graduate study begins approximately two years after commissioning. Selectees may choose their field of study from an extensive list of disciplines.

Oceanography Joint Master's Degree Program — one officer from all commissioning sources including the Naval Academy may be selected for a graduate program in ocean sciences at the Massachusetts Institute of Technology/Woods Hole Oceanographic Institution. This 27-month program leads to a master of science degree in ocean engineering and physical oceanography and a Navy warfare subspecialty designation in oceanography.

Olmsted Foundation Scholarships — established by the George and Carol Olmsted Foundation in cooperation with the Department of Defense. These scholarships support two years of graduate education at foreign universities, using foreign languages, for Navy and Marine Corps officers. Two Naval Academy graduates who have served between three and ten years of active duty are eligible each year.

William H.G. Fitzgerald Scholarship — supports two years of graduate study at Oxford University in England for two Naval Academy graduates each year.

Thomas Pownall Scholarship — supports two years of graduate study at Cambridge University in England for one Naval Academy graduate each year.

Otto A. Zipf Scholarship — supports two years graduate study at the Ruprecht-Karl University of Heidelberg, Germany, for one Naval Academy graduate of each class.

Naval Academy graduates may qualify for a number of other scholarships and fellowships awarded for study at civilian colleges and universities. These graduate studies can be pursued in various fields while graduates receive pay as commissioned Navy and Marine Corps officers. Up to 25 members of each class can begin postgraduate studies under these scholarships immediately after graduating from the Naval Academy. Such scholarships include:

Rhodes and Marshall Scholarships for two or three years of graduate study in any field leading to a master of arts or master of philosophy degree — at Oxford for the Rhodes Scholarship or at any university in Great Britain for the Marshall Scholarship — with all expenses provided for study and travel. Thirty-four midshipmen have won the Rhodes Scholarship since 1930, when Navy participation began. There have been eleven Marshall scholars from the Naval Academy since 1981.

Truman Scholarship for graduate study in any major, with emphasis on public service. Up to four midshipmen are nominated during their junior year.

Guggenheim Fellowship (Daniel and Florence Guggenheim Foundation) for graduate study at one of three major centers for research and development in rocket propulsion, space flight and space flight structures.

Hertz Fellowship (Fannie and John Hertz Foundation) for graduate study in the applied physical sciences at a choice of 27 universities.

National Science Foundation (NSF) Fellowship leading to a master of science or a master of arts degree in the mathematical, physical, biological, engineering, and social sciences and in the history and philosophy of science.

Draper Laboratory Fellowships for graduate study in technical majors at the Massachusetts Institute of Technology, Boston University or Northeastern University.

Other scholarships are available in aerospace engineering, computer science, electrical engineering, mathematics, mechanical engineering, naval architecture, nuclear engineering, ocean acoustics, and physics.

Division of Engineering and Weapons

Department of Aerospace Engineering

Department of Electrical Engineering

Department of Mechanical Engineering

Department of Naval Architecture and Ocean Engineering

Department of Weapons and Systems Engineering



Department of Aerospace Engineering

Aerospace Engineering Major

The aerospace engineering department offers one of the most exciting and challenging academic programs at the Naval Academy. The program is structured to produce naval officers who will serve in the forefront of the inception, development and employment of Navy air and space assets. The curriculum provides a background in engineering fundamentals through courses in chemistry, physics, mathematics, engineering mechanics, thermodynamics and electrical engineering. With these subjects as a base, students undertake aerospace engineering topics including aerodynamics, propulsion and aerospace structures. The major is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

In the area of aeronautics, students extend their study of aerodynamics, flight structures and flight mechanics. The astronautics track allows students to study astrodynamics, satellite attitude dynamics and control, and the space environment. Both tracks conclude with a design course, which allows midshipmen to apply their engineering knowledge to the design of an aero or space flight vehicle. Both tracks also involve thorough laboratory experimentation. The Naval Academy's aerospace laboratory facilities are some of the most advanced and extensive in the country. These facilities include structures, propulsion and rotor labs; variable stability aircraft simulator; spacecraft tracking and experimentation facilities; and various wind tunnels with flow velocities ranging from subsonic to supersonic.

While graduates of all majors are prepared for careers in Naval Aviation, the aerospace engineering major is intended for those who are not only fascinated by flight but want to understand the technology of making air and space flight work.

Graduates from the aerospace engineering major are also fully prepared to undertake postgraduate education programs in engineering disciplines either at the Naval Postgraduate School or any other academic institution. Naval officers with advanced degrees in the aerospace areas may be assigned to billets involving the research, development, test and evaluation of Navy aircraft or spacecraft projects. Locations for these challenging technical billets include the Naval Air Systems Command, Naval Research Laboratory, Test Pilot School, the Navy's Space Command, the Unified Space Command, the Navy Space Support Activity and perhaps as a naval astronaut with the National Aeronautics and Space Administration.

Curriculum Requirements (in addition to the requirements of plebe year)

Professional: NE203, NL302, NL400, NN204, NS310, NS40X;

Mathematics: SM212, SM221;

Science: SP211, SP212;

Humanities: HH205, HH206, two electives including one at the 300/400 level;

Engineering: EE331, EE332, EM211, EM214, EM217, EM232, EM319, ES300, ES410;

Major: Aeronautics Track - EA202, EA301, EA303, EA304, EA307, EA322, EA332, EA401, EA413, EA429, EA440, plus two major electives; Astronautics Track - EA205, EA305, EA307, EA322, EA362, EA364, EA365, EA461, EA465, EA466, EA467, EA470, plus one major elective.

Aerospace Engineering Courses

EA202 Principles of Flight (2-2-3). Gives a broad overview of aerospace engineering. Topics covered include history of flight, the earth's atmosphere, fluid statics, introductions to fluid dynamics, aerodynamics, and the performance of flight vehicles. *Prereq: SM122 or SM162.*

EA205 Principles of Aeronautics and Astronautics (2-2-3). An introductory course in the theory and practice of atmospheric flight, propulsion, rocket performance, space flight, satellite systems and uses, and other topics in the field of astronautical engineering. It is designed to prepare the beginning aerospace engineering student for future studies, and to develop good engineering practices. *Prereq: SM122 or SM162.*

EA301 Aerodynamics (3-0-3). Covers essentials of fluid mechanics and topics in aerodynamics including potential flow and thin airfoil theory. *Prereq: EA202 or EA205 and SM221.*

EA303 Wind Tunnel (1-2-2). A laboratory course in wind tunnel test techniques. *Corequisite: EA301.*

EA304 Aerodynamics II (3-0-3). Discussion of lifting surface theories. Introduction to viscous flow and boundary layer. External compressible flow concepts; Mach number and shockwaves, small perturbation and linearized flow methods are introduced. *Prereq: EA301 and EA307.*

EA305 Aero/Gas Dynamics (2-2-3). Covers essentials of fluid mechanics and kinematics with an introduction to potential flow. Basic one-dimensional compressible flow including thermodynamics of perfect gases in subsonic and supersonic flows. Introduction to nozzle flow. *Prereq: EA202 or EA205; coreq: EM319.*

EA307 Engineering Analysis (3-0-3). Applications of numerical theory and analysis to relevant engineering problems is the focus of this course. Topics include: solutions of systems of nonlinear equations, iteration techniques, nonlinear root-solvers, numerical integration and differentiation, and curve-fitting techniques. Applications

are used to develop the tools necessary to solve realistic problems. Knowledge of spreadsheet, calculator, and preliminary computer programming fundamentals are developed. *Prereq: EA202 or EA205*

EA322 Aerospace Structures I (2-2-3). Applications of statics and solid mechanics to the design of atmospheric and space flight vehicle structures. Topics include determinate and indeterminate space structures, generalized bending and energy methods to determine shear flows, shear centers and deflections for determinate and indeterminate semi-monocoque structures. *Prereq: EM217.*

EA332 Gas Dynamics (2-2-3). Compressible flow of one-dimensional subsonic flows. Methods of gas dynamics in internal flow systems. Shock waves, waves in supersonic flow, linearized flows. *Prereq: EA301, EM319.*

EA362 Astrodynamics I (3-0-3). Introduction to the principles of planetary and satellite motion. Topics include the classical two-body problem, orbital parameters, orbit determination and maneuvers, remote sensing geometry, types of orbits and their uses, constellation design, orbit changes, perturbations and atmospheric drag effects, rendezvous, ballistic missile trajectories, and lunar and interplanetary travel. *Prereq: EM232.*

EA364 Spacecraft Attitude Dynamics and Control (3-0-3). Rigid body dynamics and control of spacecraft. Euler angles, inertial properties of rigid and semi-rigid bodies, body-centered equations of motion, torque-free motion. Passive, active, and semi-active attitude controls. Gyroscopes and stable platforms. *Prereq: EA362.*

EA365 Rocket Propulsion (2-2-3). The principles of fluid mechanics and thermodynamics are applied to the problem of propulsion of aircraft and space vehicles. Cycle analysis, ramjets, jets and rockets. Air-breathing propulsion. Solid and liquid propellant rockets, fuels and applications. *Prereq: EA305 or equivalent.*

EA401 Applied Aero and Design (3-0-3). The basic principles for lift and drag calculations are extended to entire flight vehicle analysis. Static and dynamic point performance analysis. Introduction to energy

methods with selected optimum climb and trajectory problems. Mission analysis and carpet plots leading to design selection criteria. *Prereq: EA304*

EA413 Stability and Control (3-0-3). The aerodynamic and inertial forces and moments acting on the flight vehicle and its component parts are analyzed to determine their effect on static and dynamic stability. *Prereq: EA301*

EA417 Elements of Flight Test Engineering (2-2-3). A lecture and laboratory course designed to provide practical application of theoretical principles learned in courses in flight performance, aerodynamics, and stability and control. Topics include flight test theory and purpose, engineering test planning, flight test instrumentation, data analysis, and report writing. Activities include flight simulation, several flights in an aircraft, as well as interaction with naval flight test facilities for test data acquisition and analysis. *Prereq: EA401, EA413, and approval of Chair.*

EA421 Aerospace Structures II (3-0-3). Introduction to the finite element methods of structural analysis as applied to atmospheric flight and space flight vehicles. Topics include formulation of the element stiffness matrices, assembly of the global structural matrix, formulation of equivalent loads, energy methods and matrix equation solution methods. A design project using a finite element computer program is carried out. *Prereq: EA322.*

EA424 Structural Dynamics (3-0-3). An introductory course in structural dynamics as applied to atmospheric flight and space flight vehicles. Topics include the analysis of free, damped and forced vibrations of systems with one or many degrees of freedom; vibrations of strings, beams and rectangular plates; matrix formulation of equations of motion; introduction to the finite element method of structural dynamic analysis. *Prereq: EA322.*

EA425 Viscous Flow (3-0-3). An advanced course covering viscous flow problems including laminar, turbulent, incompressible and compressible boundary layers with heat transfer. *Prereq: EA304.*

EA427 Aerodynamics III (3-0-3). An advanced course continuing the study of compressible high-speed flow including general conservation laws for inviscid flows, unsteady flow problems, numerical techniques for supersonic flows and real gas effects. *Prereq: EA304.*

EA428 Computational Aerodynamics (3-0-3). Introduction to the major numerical techniques used in computational aerodynamics. Topics include mathematical methods, boundary conditions, stability, panel methods, lattice methods, nonlinear problems, time dependent solutions and transonic flow problems. *Prereq: EA304.*

EA429 Flight Propulsion (2-2-3). The principles of fluid dynamics and thermodynamics are specialized to the problem of propulsion of aircraft. *Prereq: EA332.*

EA430 Propulsion II (3-0-3). The second propulsion course covers turbomachinery theory including compressors, turbines, pumps, application and design methods. Combustion and cooling techniques in modern engines are introduced. *Prereq: EA429.*

EA435 The Aerodynamics of V/STOL Aircraft (3-0-3). An advanced course covering the aerodynamics of vertical and short takeoff and landing aircraft, including fixed wing and rotary wing types, with

major emphasis on the helicopter. *Prereq: 1/C, aeronautical track major.*

EA439 Special Design (1-4-3). This course, along with EA440 or EA470, provides a two-semester sequence in aerospace design for selected midshipmen. *Prereq: 1/C standing in aerospace engineering.*

EA440 Aerospace Vehicle Design (1-4-3). Preliminary design of a flight vehicle. Includes preliminary layout, weight and balance estimates, performance analysis, stability analysis and structural analysis. *Prereq: 1/C, aeronautical track major.*

EA461 Space Environment (3-0-3). Introduction to the environment of the upper atmosphere, near Earth space, and interplanetary space. Topics include: properties of the upper atmosphere and ionosphere, the geomagnetic field, radiation belts and magnetosphere of the Earth, the solar wind and interplanetary medium, remote sensing of the atmosphere and oceans, environmental implications for spacecraft design. *Prereq: SP212.*

EA462 Astrodynamics II (3-0-3). Advanced topics in astrodynamics including potential of an arbitrary body and of the earth, orbit determination from observations including numerical techniques for data smoothing, special and general perturbations of orbits and interplanetary trajectories, drag effects on low altitude orbits. Special projects. *Prereq: EA362.*

EA465 Spacecraft Communications and Power (3-0-3). This course is intended to develop communications fundamentals

with emphasis on digital communications, link budget analysis, and power subsystems. Secondary topics include: computer and data bus operations, command and data handling, telemetry, and tracking and control. *Coreq: EE332.*

EA466 Spacecraft Thermal Control (3-0-3). This advanced course covers the energy management of a spacecraft. Heat loads from external and internal sources. Heat transfer principles: radiation, conduction, and convection. Heat transfer equipment and insulation systems are introduced. System considerations including radiator design and thermal optimization are stressed. *Prereq: EA307, EM319.*

EA467 Spacecraft System Laboratory (0-4-2). Laboratory analysis of the major system elements of space systems to include ground control and power, attitude control, communications, propulsion and thermal control. Constraints imposed by system application launch vehicles and environment are considered. Introduction to the engineering design process as well as its computer adaptations. *Prereq: EA364.*

EA470 Spacecraft Design (1-4-3). Preliminary design of a spacecraft. Includes: preliminary layout, weight and moment of inertia estimates, specifications of on-board systems, power subsystem requirements and design, and constraints imposed by launch vehicle and mission requirements. *Prereq: 1/C, astronautical track major.*





Department of Electrical Engineering

Electrical Engineering Major

The Electrical Engineering Department offers one of the cornerstone disciplines that will shape many aspects of the Navy for the foreseeable future. The major offers a solid grounding in the fundamentals of electrical engineering, as well as the opportunity to investigate introductory undergraduate concepts of advanced specialties in communication systems, digital computer systems, fiber optic systems, microwaves, and instrumentation. Two elective course options are available within the major. One emphasizes the fundamentals of conventional electrical engineering and the other emphasizes digital microcomputers. The Navy needs officers trained in these engineering concepts to lead in the development, integration, and operation of advanced systems. The electrical engineering major is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET) and leads to a bachelor of science in electrical engineering.

Electrical engineering majors apply classroom concepts in the laboratory throughout the program. The Department has extensive well-equipped laboratories to provide excellent hands-on support of every course in the EE major. Dedicated laboratories support EE courses in fiber optics, electronics, digital and analog communications, operation and integration of digital hardware and software, electro-mechanical energy conversion, and advanced electrical engineering project design. The Department emphasizes individual lab station learning to ensure thorough understanding of required skills as well as the team approach to solving design problems. EE labs are constantly updated with leading edge technology.

The electrical engineering capstone senior design laboratory sequence (EE411 and EE414) integrates all required critical aspects of complete significant professional design. Two midshipmen per year are awarded the EE Department's Steinmetz Prize for innovative work in this laboratory course sequence. The Captain Boyd R. Alexander Prize in electrical engineering is presented during Commissioning Week to the outstanding graduate in the EE major.

Graduates of the electrical engineering program are very well prepared for many of the jobs they may be assigned in the fleet. The major also provides an excellent fundamental background and foundation for continued, more specialized study in electrical engineering at the graduate level on active duty after commissioning at the Naval Postgraduate School or any other academic institution.

Curriculum Requirements (in addition to the requirements of plebe year)

Professional: NE203, NL302, NL400, NN204, NS310, NS40X;

Mathematics: SM221, SM212;

Science: SP211X, SP212X;

Humanities: HH205, HH206, and two elective courses including one at the 300/400 level;

Engineering: EM318, EM319, ES300, ES410;

Major: SI204, SM313, EE221, EE228, EE242, EE322, EE341, either EE342 and EE372 or EE411, EE461, SI220 and EE414, plus three major electives.

Electrical Engineering Courses

EE221 Introduction to Electrical Engineering I (3-2-4). Terminal characteristics of passive linear and nonlinear devices, ideal energy sources (including dependent sources), and the basic laws of circuit analysis are introduced. Analysis of networks comprised of these devices including: steady-state DC/AC response, transient response of first-order circuits, methods of network analysis, and the concept of equivalence. The personal computer (PC) is employed as a tool that supports concept development, analysis, and understanding. *Prereq: Calculus I.*

EE228 Introduction to Electrical Engineering II (3-2-4). Continued development of various fundamental concepts of basic circuit theory including: behavior of second-order circuits; various concepts of AC power; coupled coils; and signal representation in the frequency domain, including frequency response and filtering. Basic principles of operation of electromechanical energy conversion devices are introduced, and circuit models are developed to predict performance. The PC is employed as a tool that supports concept development, analysis in the lab, and understanding of homework problems. *Prereq: EE221.*

EE242 Digital Systems (3-2-4). Fundamentals in realizing a digital system. Topics covered include Boolean algebra, Karnaugh mapping, and state diagrams for system minimization and analysis of sequential and logic function circuits, as well as digital multiplexer applications to design, plus counter and register design. An introduction to microcomputer systems is provided with applications to projects. *Prereq: EE221.*

EE300 Introduction to Fundamental Electrical Technology (3-2-4). Provides basic vocabulary and analytical building blocks for understanding elementary AC and DC circuits which can be used to make simplified models of fleet systems. Basic linear circuits of ideal resistors, capacitors, and inductors are analyzed using Kirchhoff's and Ohm's Laws to predict steady state and first order transient voltage, current, and power characteristics. Laboratory exercises employ standard measurement equipment found in the fleet to compare and contrast theoretical prediction with real circuit performance. *Prereq: SP212.*

EE 301 Electrical Fundamentals and Applications (3-2-4). Provides an understanding of AC and DC circuits which can be used to make simplified models of fleet systems. Circuits of ideal resistors, capacitors, inductors and sources are analyzed to predict steady state and first order transient voltage, current, and power characteristics. Principles of operation and analysis techniques for ideal

transformers are also covered. Laboratory exercises employ standard measurement equipment found in the fleet to compare and contrast theoretical prediction with real circuit performance. *Prereq: SP 212.*

EE302 Electrical Machines and Information Technology Systems (3-2-4). This course begins with a continuation of the application of modeling and analysis to rotating electric machinery. Basic principles of digital logic circuitry are then introduced followed by an introduction to computer architecture. The principles of analog and digital communications are presented to include the most common digital modulation techniques. Link budget analysis and the principles associated with satellite communications are also covered. The course ends with a study of the engineering fundamentals of networking including topology, connectivity, routing, queuing, bandwidth, spectrum utilization, the OSI Model, TCP/IP, and the Internet as an application of networking concepts. *Prereq: EE301.*

EE311 Electrical Fundamentals and Applications I (3-2-4). Provides an understanding of: terminal characteristics of basic ideal sources and passive circuit elements; basic techniques of analyzing simple DC, first-order transient, and steady state AC circuits composed of these basic building blocks, that model characteristics of real devices. Also covered are the principles of operation and analysis techniques for ideal transformers. *Prereq: SP212.*

EE312 Electrical Fundamentals and Applications II (3-2-4). A continuation of the application of modeling and analysis to rotating electric machinery and practical electronic devices such as diodes, transistors, and op-amps. Also covered are basic amplifiers, frequency response characteristics, and use of diodes and transistors as switches. Basic principles of digital logic circuitry are also introduced. This course also covers the theory of amplitude and frequency modulation (AM and FM) from the viewpoint of naval systems applications. *Prereq: EE311.*

EE313 Logic Design and Microprocessors (3-2-4). Introductory course that progresses from fundamental logic gates through a sequential controller, covering both combinational and sequential circuits. Fleet applications are stressed. *Prereq: EE300 or per. of chair.*

EE322 Signals and Systems (2-2-3). The principles of circuit analysis are extended to the transmission of signals through linear systems. The approach is based on determination and interpretation of natural frequencies, pole-zero diagrams, and their relation to the state equations. Transform techniques are applied to the analysis of analog circuits and

filters. High-level computer software is used to model and analyze signal processing and circuit response. *Prereq: EE228.*

EE331 Electrical Engineering I (3-2-4). A study, for non-EE engineering students, of fundamental ideal DC and AC electrical elements and circuits that addresses both design and fleet applications. Circuit analysis also includes natural and forced response of first-order systems, and AC characteristics in both the time and frequency domains, plus the characteristics of ideal transformers. Some labs add emphasis on design of simple electric circuits to meet a range of performance specifications. *Prereq: SP212.*

EE332 Electrical Engineering II (3-2-4). Continues non-EE engineering students' survey of electrical engineering. Addresses both design and fleet applications. Includes characteristics and analysis of rotating machines, the applications and models of diodes, op amps, and transistors. Emphasis is placed on understanding, modeling, and use of amplifiers and switches. Methods and applications of AM and FM modulation and demodulation and combinational and sequential digital logic are introduced. Some labs add emphasis on design of simple electric circuits to meet a range of performance specifications. *Prereq: EE331.*

EE341 Electronics I (3-2-4). Major semiconductor devices (p-n junction diode, bipolar and field effect transistors) are introduced by presenting a physical picture of internal behavior. Device characterization in terms of appropriate external variables then leads to construction of small-signal and large-signal models. Emphasis is on large-signal and digital applications of these device models, especially in integrated circuit form. Applications in basic amplifier and switching circuits are emphasized in the weekly laboratory exercises. *Prereq: EE221 or EE311 or EE331.*

EE342 Electronics II (3-2-4). Small signal and analog applications in integrated circuit operational amplifier designs. Hybrid parameter and hybrid Pi models are used to predict voltage, current and power gains; input and output impedances; and frequency response of single-stage and cascaded amplifiers. The feedback concept is discussed in detail, stability is treated quantitatively, and the relationship between amplifiers, oscillators and filters is developed. The course concludes with power circuits and systems. *Prereq: EE341*

EE354 Modern Communication Systems (3-2-4). Basic digital signal implementation and processing techniques are introduced. Various digital modulation methods as well as AM and FM methods are studied. Baseband modulation and demodulation techniques are

introduced. Probability theory is applied to determine error performance in a binary system. *Prereq: EE341.*

EE 372 Engineering Electromagnetics (3-0-3). Fundamentals of electromagnetic theory and modern transmission systems. Maxwell's equations are formulated and applied to electrostatic and electromagnetic problems including waveguides and basic antennas. Computer usage is emphasized in student projects. *Prereq: SP212 or SP222.*

EE411 Electrical Engineering Design I (2-2-3). Practice in engineering design. The total design process, wherein such concerns as technical design, safety, economics, optimization, ethics, and societal impact are tied together, is emphasized. A small project is executed and evaluated. Each student chooses a project and develops and submits a proposed design to be completed in EE414. The proposal is presented to the student's peers and project advisors in lieu of a final exam. *Prereq: EE341.*

EE414 Electrical Engineering Design II (0-4-2). Practice in actual engineering and prototype testing and development. Following approval by the instructor, the midshipman breadboards, troubleshoots, and completes construction and packaging of the final design. Gathering performance data and writing a final project report are followed by presentation of a formal briefing on the completed project to peers and EE dept. faculty in lieu of a final exam. *Prereq: EE411.*

EE422 Machine Control (3-2-4). Application of the principles of electromechanical energy conversion to the analysis of various devices, which configure power and control systems. Basic power electronic components are introduced and applied to circuits used in power generation and in control of energy conversion devices. *Prereq: EE332 or EE341.*

EE424 Electronic Instruments and Measurements (2-4-4). Fundamentals of electronic measuring instruments with emphasis on digital instruments and on the use of microcomputers in measurements. Not offered every year. *Prereq: EE341.*

EE426 Fundamentals of Electronic Instrumentation (2-2-3). Fundamentals of electronic instrumentation devices and transducers that are used to sample physical phenomena such as force, light, heat, and displacement. Topics focus on the major components of electronic instrumentation systems: sensors, data acquisition, signal conditioning, and computer control. *Prereq: EE311 or EE331.*

EE431 Communications Theory I (3-2-4). An introduction to analog and digital communication systems and concepts. Fourier spectrum and information content of a signal are defined,

characteristics of linear filters are explored and the sampling theorem is developed and applied. Amplitude, frequency, phase and pulse-code modulation techniques are studied in depth. Time and frequency division multiplexing concepts are developed and applied. Signal to noise ratios in analog communication systems are compared and statistical techniques are used for computer error rates in digital communication systems. *Prereq: EE362 or permission of chair.*

EE432 Communications Theory II (3-2-4). Basic digital signal processing principles are studied and applied to modern radar, sonar and communications systems. Discrete Fourier Transform (DFT) is introduced, its properties are explored and the Fast Fourier Transform (FFT) algorithm is developed. Correlation, convolution, spectral analysis, matched filter detection and complex demodulation techniques are explored using the FFT algorithm. Digital filters are designed and applied to random and deterministic signals. Statistical concepts (PDF, CDF) are introduced to study random errors in spectral analysis. Laboratory work involves the use of small, high-speed microcomputers to solve practical design problems. *Prereq: EE362 or per. of chair.*

EE433 Wireless and Cellular Communications Systems I (3-2-4). An in-depth study of the wireless and cellular system concept. This study includes system design, mobile radio propagation (large-scale path loss, small-scale fading, and multipath), and modulation techniques for mobile radio. A working knowledge of the characteristics of the three major cellular/PCS systems in use in the U.S. today is also developed. Technical discussions of recent topics/publications related to the course material are also conducted. Laboratory experiments emphasize indoor and outdoor RF propagation measurements. A final project is required in lieu of a final examination. *Prereq: EE354 or permission of chair.*

EE434 Wireless and Cellular Communications II (3-2-4). A continuation of the in-depth study of the wireless and cellular system concept. This study includes modulation techniques for mobile radio, equalization, diversity and channel coding. Small group research projects are conducted in lieu of a final exam. *Prereq: EE487A or permission of chair.*

EE451 Electronic Properties of Semiconductors (3-0-3). Develops an understanding of those semiconductor parameters that relate to the performance of semiconductor devices. Hole and electron conduction and charge carrier distribution as a function of energy are developed. Charge carrier generation and recombination and carrier dynamics leading to drift and diffusion are used to study semiconductor transport phenomena. The p-n junction and the bipolar junction transistor are studied in detail. *Prereq: SP212 or SP222 or per. of chair.*

EE452 Semiconductor Electronics (3-2-4). An introduction to the physics and technology of planar silicon devices and integrated circuit. The physics of the silicon-silicon dioxide interface is developed and is used to study the MOSFET. Analysis and design of digital integrated circuit is emphasized. The laboratory involves an individual student research project. *Prereq: EE451.*

EE461 Microcomputer Based Digital Design (3-2-4). A principles based foundation to the concepts and techniques used in analyzing and designing traditional and microprocessor-based digital systems. The student will acquire a detailed understanding of the system bus, the architecture and interfacing of various processor memory, and input-output elements, the instruction set, and assembly language programming. Emphasis is on concepts that will have long-term value. This course is supported by a continually updated laboratory. *Prereq: EE342 or EE332.*

EE462 Microcomputer Interfacing (2-4-4). This course provides a strong foundation in techniques for connecting computers to peripherals and communications devices and in the methodology for programming the computer to control external devices in real time. This course is supported by a project-oriented laboratory. *Prereq: EE461.*

EE464 Introduction to Networking (3-2-4). This is a course in fundamentals of data and computer communications. The course emphasizes both the fundamental principles as well as the critical role of performance in driving protocol and network design. It explores the critical technical areas in data communications, wide-area networking, local area-networking and protocol design. *Prereq: EE354 or permission of chair.*

EE471 Microwave Systems (3-2-4). An introduction to the nature of electromagnetic waves. Time varying Maxwell's equations are developed and solutions to wave equations presented. Characteristics of microwave components such as power sources, amplifiers, filters and wave-guides are considered. The methods of distributed parameter circuit analysis are introduced. Applications of microwave devices in systems are discussed with emphasis on systems integration. *Prereq: EE372 or permission of chair.*

EE472 Fiber Optical Communications (3-2-4). An introduction to the nature of optical wave-guides and fiber optical communications systems. Time varying solutions of Maxwell's equations are developed for slab and cylindrical optical waveguides and the modes of propagation are studied. Light emitting diodes, lasers and optical detectors are examined, and a complete optical communication system is analyzed. *Prereq: EE354 or EE372.*



Department of Mechanical Engineering

Mechanical Engineering Major

The mechanical engineering major, accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology, offers one of the most diversified engineering programs available at the Naval Academy. In addition to an education in mechanical engineering, the program prepares its graduates to assume responsibilities in any of the warfare specialties of the U.S. Navy and U.S. Marine Corps. Immediate graduates will be in positions of responsibility involving the operation and maintenance of high technology weapons systems. As officers progress through their careers, many will assume positions of responsibility as managers of weapons systems development and procurement. This dictates a program that emphasizes a broad spectrum of undergraduate studies. The program thus includes required courses in solid and fluid mechanics, dynamics, thermodynamics and energy systems, materials engineering and a significant emphasis on electrical engineering and control systems fundamentals. This broad background in the fundamentals of mechanical engineering prepares midshipmen to select elective courses in any of the five tracks within the mechanical engineering program. These tracks are: energy systems, engineering mechanics, marine propulsion, materials engineering and nuclear engineering. A midshipman may choose to specialize in a particular area by selecting all of their major electives in one track, or a more general approach can be taken by selecting electives across several tracks.

The program takes seriously the need to develop graduates who have a sound understanding of the design process and its importance in the success of engineering activity. Design education in the program is focused in a sequence of five courses beginning in the first semester of the sophomore year (EM215, EM375, EM371, EM477, EM472), which make up the design backbone. Each semester other courses which are more often identified with engineering science support the backbone through problems and small projects that build on concepts and tools developed in the design core. This approach weaves the subjects of design and design tools into the program as an integrated engineering activity.

A Navy or Marine Corps officer with a bachelor's degree in mechanical engineering is well equipped for a wide variety of career assignments both ashore and afloat. Operational sea billets in surface ships, submarines and aircraft squadrons provide many opportunities for a mechanical engineer to develop practical experience in a warfare or engineering specialty area while contributing to fleet engineering and material readiness. The operational environment enables a junior officer to rapidly develop sound leadership and managerial abilities while refining mechanical engineering capabilities acquired at the Naval Academy. Ashore, the mechanical engineer has a wide range of opportunities in sub-specialty billets with naval applications. These include such areas as ship and aircraft design, propulsion systems, environmental systems, advanced engineering education, major project management and weapons systems acquisition. There is an abundant and continuing need for mechanical engineers throughout today's naval service.

Curriculum Requirements (in addition to the requirements of plebe year)

Professional: NE203, NL302, NL400, NN204, NS310, NS40X;

Mathematics: SM212M, SM221;

Science: SP211 and SP212;

Humanities: HH205, HH206, and two electives including one at the 300/400 level;

Engineering: EE331, EE332, EM211, EM217, EM232, EM313, EM319, EM324, ES300, ES410;

Major: EM215, EM320, EM371, EM375, EM415, EM472, EM477, plus three major electives.

General Engineering Major

The general engineering major provides a basic technical education in mathematics, science, engineering and naval professional subjects. It offers a broad engineering background for future naval service and for additional advanced technical training and education. Midshipmen completing the general engineering major receive a designated bachelor of science degree.

Curriculum Requirements (in addition to the requirements of plebe year)

Professional: NE203, NL302, NL400, NN204, NS310, NS40X;

Mathematics: SM221, SM230;

Science: SP211, SP212;

Humanities: HH205, HH206 plus two electives including one at the 300/400 level;

Engineering: EE300, EN200, ES310, ES420;

Major: EE313, EM211, EM232, EM214, EM318, EM319, EN200, SM212, plus eight major electives



Mechanical Engineering Courses

EM211 Statics (3-0-3). An initial course in applied vector mechanics with emphasis on static equilibrium. Topics include forces, moments, couples, equivalent force-couple systems, centroids, distributed forces, and Coulomb friction. The application of the free body diagram in the analysis of static equilibrium of frames, machines and trusses is stressed. *Coreq: Calculus III and Physics I.*

EM214 Elements of Materials Science (2-2-3). An overview course investigating the structure-property-processing relationship of engineering materials. Emphasis is placed on understanding the general behavior and capabilities of the different types of materials including metals, ceramics, polymers and composites. Materials selection and design are discussed and laboratories and demonstrations are utilized to address material properties as they are affected by environment and service. *Prereq: Chemistry II; coreq: Physics I.*

EM215 Introduction to Mechanical Engineering (1-2-2). This is an overview course that introduces the student to the main areas of mechanical engineering, mechanics, materials, and thermoscience. In addition, it provides background in visualization skills and the design process. Projects are used to enhance the understanding of mechanical engineering and the design process. *Prereq: none.*

EM217 Strength of Materials (3-2-4). A first course in mechanics of deformable bodies with emphasis on the engineering approach to the responses of these bodies to various types of loadings. Topics include stress-strain relationships, stress-strain analysis, stress and strain transformation (Mohr's circle), load-deflection, bending, torsion, buckling, and temperature effects. *Prereq: EM211; coreq: SM212.*

EM232 Dynamics (3-0-3). A course in classical vector dynamics. Topics include vector algebra and calculus, kinematics and kinetics of particles and rigid bodies, as well as energy and momentum methods. Extensive problem solving involving particle and rigid body motion is required. *Prereq: EM211; coreq: SM212.*

EM300 Naval Engineering II (3-2-4). A study of naval engineering systems, including the principles of energy conversion and the

basic operation of steam, gas turbine and internal combustion engine power plants. *Prereq: SP211, 1/C cruise.*

EM313 Materials Science (3-2-4). An introductory course in the physical and mechanical properties of engineering design materials including metals, ceramics and plastics, their structures, use in engineering applications and failure phenomena. All laboratory projects are structured to provide strong physical illustrations for the topics covered in lectures. *Prereq: EM217.*

EM318 Applied Fluid Mechanics (3-0-3). A first course in incompressible fluid mechanics. Topics include properties of fluids, fluid statics, integral conservation equations, differential field analysis, dimensional analysis and similitude, incompressible boundary layers, viscous flow in conduits and flow about immersed bodies. *Prereq: SM212.*

EM319 Engineering Thermodynamics (3-0-3). A basic thermodynamics course in which the first and second laws of thermodynamics are studied primarily from the classical macroscopic viewpoint and applied to both closed and open systems. Working substances include perfect gases, real gases and vapors in addition to solids and liquids. Naval applications are emphasized. *Coreq: SM212.*

EM320 Applied Thermodynamics (2-2-3). Laboratory equipment which operates on principles of thermodynamics and fluid mechanics is used to reinforce analyses and design of gas and vapor power cycles, refrigeration and air conditioning, ship and aircraft propulsion systems, combustion, energy conversion and compressible flow. *Prereq: EM319 or equivalent.*

EM324 Fluid Dynamics (3-2-4). An introductory course in fluid dynamics stressing both the integral and differential forms of the conservation laws of fluid flow. Engineering applications are made to hydrostatics and to ideal and real fluid flows. Laboratory experiments and problems sessions complement the lectures. *Coreq: EM319 or equivalent.*

EM362 Reactor Physics I (3-0-3). An introductory course in nuclear reactors covering radioactivity, fission, neutron diffusion, material and geometric buckling and the critical equation. Bare and reflected homogeneous reactors are studied. *Prereq: SM212 or equivalent.*

EM371 Introduction to Design (2-2-3). Fundamentals of mechanical design, with emphasis on the design of pertinent machine elements. Topics such as fasteners, springs, anti-friction bearings, lubrication and journal bearings, gearing and shafts are covered. Also included are static and fatigue failure theories. *Prereq: EM217, EM232.*

EM375 Mechanical Engineering Experimentation (2-2-3). A design course that emphasizes the theory and practical considerations associated with contemporary experimental procedures, methods and design strategies. Topics include measurement error and its propagation, equation fitting and plotting, signal acquisition and validation, instrument response and elements of experimental design. Emphasis includes computer aided data reduction, modeling of a system and report writing. *Prereq: SM212, EM217, EM232.*

EM380 Engineering Review (0-2-0). A comprehensive review course to prepare students to take the Engineer-In-Training (EIT) or Fundamentals of Engineering (FE) examination. Topics include mathematics, chemistry, computers, electrical engineering, engineering economics, statics, dynamics, thermodynamics, fluid mechanics, and mechanics of materials. *Prereq: 1/C engineering major.*

EM415 Heat Transfer (3-2-4). Study of thermal radiation, steady and transient conduction, laminar and turbulent convection, internal and external flow, boundary layers and empirical correlations. Applications address fins, nuclear reactor cooling, heat exchangers and interactive computing. *Prereq: EM319 and EM324.*

EM423 Mechanical Vibrations (2-2-3). The treatment of vibration fundamentals including free, damped and forced harmonic vibrations of linear single and multi-degree of freedom systems, modal analysis, continuous systems and a practical project. *Prereq: EM217, EM232.*

EM432 Computer Methods in Structural Mechanics (3-0-3). Structural design and analysis; matrix formulation employing flexibility and stiffness methods of analysis, computer languages and techniques in structural design. Topics include temperature effects, effects of settlement of supports and misfit of structural parts. *Prereq: EM217.*

EM433 Computer-Aided Manufacturing (2-2-3). This course examines how computers and automation are used in modern manufacturing processes. Topics include machining processes, CNC programming, process planning, dimensioning, and tolerancing. Students participate in a manufacturing project, which utilizes CAD/CAM software to design and manufacture a component using CNC machining equipment. *Prereq: EM477.*

EM434 Advanced Mechanics of Materials (3-0-3). Topics include theories of elasticity and plasticity, stress and strain as tensors, compatibility and constitutive relationships, energy methods, stability, yield functions, behavior of time dependent materials, plasticity limit theorems, plastic design. *Prereq: EM217.*

EM436 Mechanics of Composite Structures (3-0-3). An introductory course that emphasizes the mechanics of structures containing composite materials. Topics covered include the generalized Hooke's Law, lamina constitutive relationships, mechanics of fiber reinforced lamina, lamina strength analysis, and the mechanics of composite laminates. Analysis is accomplished through computer lab assignments. *Prereq: EM217.*

EM443 Energy Conversion (3-0-3). Introduction to energy conversion and utilization. Terrestrial and thermodynamic limitations, direct energy conversion devices, alternative energy sources, present and future energy research design and development and energy usage and economy are presented. *Prereq: EM319 or equivalent.*

EM446 Heating, Ventilation and Air Conditioning: Design and Analysis (3-0-3). Principles of thermodynamics, heat transfer, and fluid mechanics as applied to the design and control of thermal environments. Cycles and equipment for heating, cooling and humidity control. Air transmission, distribution and cleaning are also considered. *Prereq: EM319 and EM320 or equivalent.*

EM453 Materials: Processing and Fabrication (3-0-3). State-of-the-art and advanced process and fabrication techniques are examined for metallic, polymeric and composite materials. Aspects of the production of the basic components of material systems are examined. Also, post processing and fabrication thermal treatments to improve

the material system will be discussed. The course is directed to proper process and fabrication selection for efficient and safe design of mechanical systems. *Prereq: EM313 or EM214.*

EM454 Mechanical Behavior of Materials (3-0-3). Treatment of mechanical behavior from a materials viewpoint. In addition to metallic materials, engineered materials, such as metallic, polymeric and ceramic composites are included. Elastic and elastic-plastic behavior are treated, as well as modes of fracture, including brittle and ductile. Scanning electron microscopy is performed for fractography. Ductile-to-brittle transition, elastic fracture mechanics, fatigue and creep are considered. *Prereq: EM214 or EM313, and EM217.*

EM456 Corrosion and Corrosion Control (3-0-3). A course dedicated to the study of various types of corrosion including the electrochemical and metallurgical mechanisms responsible for each and their prevention. The course concentrates principally on the structural alloys used in the marine environment. Laboratory sessions involve demonstrations and hands-on experiments, which complement the lecture material. *Prereq: EM313 or EM214.*

EM458 Failure Analysis (3-0-3). A course designed to introduce the student to the principles, tools and techniques used in the analysis of materials failures. Laboratory skills in non-destructive testing, optical and electron microscopy, mechanical testing, corrosion and wear testing are developed. Emphasis is placed on actual case histories and the student is required to complete analysis of a failed component. *Prereq: EM217, EM313 or EM214.*

EM461 Engines: Principles, Design and Applications (2-2-3). The course objective is to provide a fundamental understanding of reciprocating internal-combustion engine design and operation. This is achieved by linking existing engine hardware design and performance analysis to concepts and disciplines studied in the mechanical engineering curriculum. *Prereq: EM320 or approval of department chair.*

EM463 Reactor Physics II (2-2-3). The topics covered include neutron generation times, reactor period, delayed neutrons, negative temperature coefficient, xenon poisoning, control rod theory, shielding and a reactor kinetics case problem. *Prereq: EM362.*

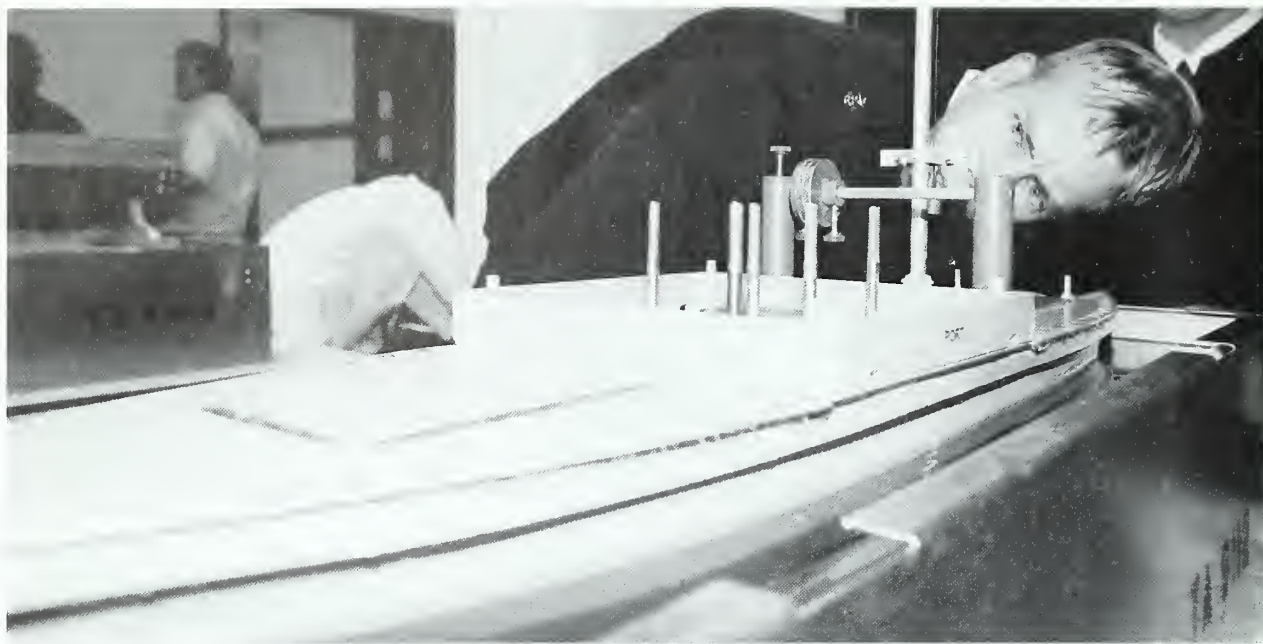
EM468 Nuclear Energy Conversion (3-0-3) Principles of the conversion of nuclear energy into useful power are covered. Various types of nuclear power plants, their design, cycles, load following characteristics etc., are studied. Advanced nuclear energy conversion systems, including fusion, are also studied. *Prereq: EM362.*

EM472 Mechanical Design (2-2-3) A capstone study of the engineering design process emphasizing the integration of objectives, analysis of alternatives and synthesis of components. Practical experience is gained by participation in team projects. *Prereq: EM371 and EM477, or approval of department chair.*

EM474 Gas Turbines: Design and Analysis (2-2-3). A course designed to acquaint the student with the design and analysis of modern gas turbine engines currently employed by the U.S. Navy. The emphasis is on the constraints and limitations of the various components that comprise shaft power gas turbine engines such as axial and centrifugal compressors, combustors, axial and radial turbines, intercoolers, reheaters, regenerators and inlet/exit diffusers and nozzles. In addition, component matching and the problems associated with it will be studied. Also, future concepts in turbo machinery propulsion will be discussed. The course assumes a basic knowledge of thermodynamics and will add to the student's knowledge in such areas as compressible flow in turbo machinery, combustion analysis and emissions control. The culmination of the course is a final design project. *Prereq: EM320.*

EM476 Undersea Power Systems (3-0-3). The principles of design of undersea power systems are presented. Topics include batteries, fuel cells, thermoelectrics, magnetohydrodynamics, thermophotovoltaics, and OTEC. *Prereq: EE332, EM318 or EM324, EN245 or permission of department chair.*

EM477 Computer-Aided Design (2-2-3). A design course using the workstation environment and selected software in mechanisms. Solid modeling and finite element analysis are used to generate solutions based on performance related objectives. *Prereq: EM371.*



Department of Naval Architecture and Ocean Engineering

Naval Architecture Major

The naval architecture major is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology. This major came into being as an engineering discipline because of a single unique and complex end-product, the ship. A special combination of knowledge and experience is needed to design and build a ship. Variety exists not only in the kinds of work (research, design, cost-estimation, fabrication, and management), but also in the types of craft involved—from sailboats to aircraft carriers, hydrofoil boats to catamarans, and submarines to surface-effect vehicles.

Naval architects use both art and engineering in designing ships. Armed with imagination and experience, they convert functional requirements into a suitable, cost-effective design. They analyze and select the best dimensions and hull form, calculate the power requirements, and estimate the weights of the principal components. They design and analyze the hull structure and decide on the location of military sub-systems, machinery spaces, habitability and support spaces, and tankage. Additionally, the ship must be subdivided into watertight compartments so that, if damaged, the chances of survival are maximized. Weighing and resolving the many conflicting requirements in the design of a ship are the creative and challenging responsibilities of the naval architect.

Naval architecture at the Naval Academy approaches these topics in a fully integrated program of classroom sessions, hands-on laboratory work, field trips, and the latest in computer-aided ship design and analysis techniques. A naval architecture design room, two towing tanks, a circulating water channel, and a static stability tank are some of the many facilities available to midshipmen majoring in naval architecture. A distinguished and innovative faculty complement these excellent facilities and contribute to making this an outstanding undergraduate engineering major. A bachelor of science in naval architecture is awarded.

Curriculum Requirements (in addition to the requirements of plebe year)

Professional: NE203, NL302, NL400, NN204, NS310, NS40X;

Mathematics: SM212, SM221;

Science: SP211, SP212;

Humanities: HH205, HH206 plus two electives including one at the 300/400 level;

Engineering: EE331, EE332, EM211, EM217, EM232, EM318, EM319, ES300, ES410;

Major: EN245A, EN342, EN353, EN358, EN380, EN455, EN471, EN476, plus two major electives



Ocean Engineering Major

Ocean Engineering holds the key to the last frontier on earth, the ocean depths. While marine scientists provide us with a basic knowledge of the ocean environment, the ocean engineer enables us to use this environment more effectively. By blending the fundamentals of mathematics, physics, chemistry and oceanography with knowledge of the engineering sciences, including ocean materials and wave mechanics, the ocean engineer plans, designs and builds a variety of coastal, harbor, and offshore structures; unmanned underwater vehicles and diver-support equipment; underwater acoustic systems; ocean energy and other marine-related environmental systems. Multi-disciplinary in nature, ocean engineering will appeal to civil, electrical, environmental and mechanical engineers who wish to practice in the ocean realm.

The ocean engineering major is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology. The major offers an integrated program of study, using a balance between classroom theory, laboratory work and practical application providing midshipmen with the background to work effectively as ocean engineers. Laboratory experiments are conducted in the 120-foot and 380-foot wave and towing tanks and coastal engineering basin. These are equipped with electro-hydraulic wave-makers and instrumented with sophisticated sensors and on-line data acquisition and analysis equipment. A circulating water channel, hyperbaric test facility and an environmental chamber are also available. The Naval Academy's computer systems are used in solving design problems and preparing computer-aided designs. Supervising, directing and teaching this program is a team of professionals recognized for providing one of the finest undergraduate majors in ocean engineering available in the country. A bachelor of science in ocean engineering is awarded.

Curriculum Requirements (in addition to the requirements of plebe year)

Professional: NE203, NL302, NL400, NN204, NS310, NS40X;

Mathematics: SM212, SM221;

Science: SP211, SP212;

Humanities: HH205, HH206, and two electives including one at the 300/400 level;

Engineering: EE331, EE332, EM211, EM217, EM232, EM318, EM319, ES300, ES410;

Major: EN245, EN380, EN441, EN461, EN462, EN475, SO221, plus four major electives.

Naval Architecture and Ocean Engineering Courses

EN200 Naval Engineering I (3-2-4). An introduction to ship systems, including basic methods of ship procurement, construction and power plant selection. Principles of ship stability and operability as related to preventive and corrective damage control. *Prereq: NS100, SP211, 3/C cruise.*

EN245 Principles of Ocean Systems Engineering (2-2-3). This course provides a broad overview of the engineering disciplines, which deal with the ocean environment. Topics include an introduction to engineering graphics and Computer-Aided Drafting (CAD), hydrostatics, stability and buoyancy, an introduction to resistance and powering, basic wave mechanics and an introduction to engineering design. *Prereq: EM211.*

EN245A Principles of Ocean Systems Engineering (2-2-3). This course, which is intended for midshipmen majoring in naval architecture, provides an overview of those engineering disciplines, which facilitate the study of naval architecture. Topics include introductions to engineering design, engineering graphics, computer-aided drafting (CAD), numerical methods, applied probability and statistics, buoyancy, ship structures, and marine propulsion systems. *Prereq: EM211.*

EN 300 Naval Engineering II (3-2-4) A study of naval engineering systems, including the principles of energy conversion and the basic operation of steam, gas turbine and internal combustion engine power plants. *Prereq: SP211, 1/C cruise.*

EN320 Micro Computer Aided Engineering and Design (2-2-3). A fundamental course in engineering applications of the personal computer. Covers problem-solving techniques utilizing computer-aided design, spreadsheet and equation modeling software. Develops skills required to undertake an engineering research or design project. *Prereq: engineering major.*

EN342 Ship Hydrostatics and Stability (3-2-4). Theories and procedures for predicting a ship's hydrostatic response to various conditions are addressed. Methods for computing the stability characteristics of

both intact and damaged ships are studied. Floodable length computations are taught. Stability and subdivision criteria are explained. The lines plan for a hull form is developed and analyzed. *Prereq: EN245 or EN245A.*

EN353 Resistance and Propulsion (3-2-4). Topics include dimensional analysis, similitude, wave and viscous resistance of ships, ship-model testing techniques, full-scale performance prediction, momentum theory of propulsive devices and propeller vibrations and design. The course also covers the experimental aspects of marine vehicle resistance and propulsion. *Prereq: EN245 or EN245A, EM318 or EM324.*

EN358 Ship Structures (3-2-4). A course in structural theory and practice. Topics include longitudinal and transverse strength of the hull girder, bending moments in a seaway, plate theory, development of ship structural design, submarine pressure hull design and shipbuilding materials. *Prereq: EM217; coreq: EN353.*

EN361 Marine Power Systems (2-2-3). Applies the concepts of thermodynamics, fluid dynamics and other fundamental principles to marine power systems. Includes the combustion of fuels to produce heat energy and how it is converted to power in engines, steam power plants and gas turbines. Topics covered are psychometrics, air conditioning, heat pumps, diesel engines, gasoline engines, gas turbines, steam turbines, incompressible flow, compressible flow, mass/energy balance, heat exchangers, computer aided design and experimental design. *Prereq: EM319; coreq: EM318 or EM324.*

EN380 Naval Materials Science and Engineering (3-0-3). Deals with the optimal use of materials in ocean systems with emphasis on corrosion prevention. Fracture mechanics and basic materials science. *Prereq: SC111/112 or SC121/122; coreq: EM217.*

EN411 Ocean Environmental Engineering I (3-0-3). An introduction to basic principles and current issues in environmental engineering as applied to the ocean environment. Topical coverage includes chemical and biological considerations in water quality, diffusion and dispersion in estuaries and oceanic environments, engineering

methods used to analyze and mitigate the effects of marine pollution, and environmental ethics and regulatory statutes. *Prereq: EM318 or EM324 and EN475.*

EN412 Ocean Environmental Engineering II (3-0-3). Basic principles and current issues in environmental engineering as applied to the ocean environment are introduced. Principal focus is on ocean resources: their identification, recovery and utilization. Topical coverage includes the technological aspects of alternate energy sources; deep-ocean oil and gas recovery; desalinization; dredging and uses for dredge spoil; mineral exploitation; ocean depositories; wetlands, reefs and other coastal developments; and environmental economics, ethics, and regulatory statutes. *Prereq: 1/C, engineering major or permission of chair.*

EN420 Coastal Engineering (2-2-3). A study of littoral drift and wave action on coastal structures. Topics include littoral drift past a river estuary, breakwaters, jetties, groins and harbor design. *Prereq: EM217, EM318 or EM324, EN441, or equivalent.*

EN430 Underwater Work Systems (3-0-3). Acquaints the student with design and operational considerations for manned submersibles, unmanned remotely operated vehicles and deep dive systems. *Prereq: 1/C engineering major or permission of chair.*

EN440 Design of Foundations for Ocean Structures (3-0-3). Design and analysis of gravity pile and anchored foundations for ocean and coastal facilities fixed to the seafloor. Includes recommended practices and procedures for planning, designing and constructing adequate foundations for marine structures. *Prereq: EM217, 1/C EOE major or permission of chair.*

EN441 Ocean Engineering Structures I (3-0-3). Structural design considerations for fixed ocean structures, mooring systems and undersea vehicles are analyzed. Design techniques including matrix methods and finite element analysis are introduced. Boundary conditions, wave effects, foundations, loading and materials considerations are studied. *Prereq: EM217.*

EN442 Ocean Engineering Structures II (2-2-3). A course in structural design theory and practice. Basic structural elements of offshore and coastal structures are designed

using current engineering design codes. Topics include material properties, connection methods, and design of steel, timber, and concrete structures. *Prereq: EN441.*

EN450 Engineering Economic Analysis (3-0-3). Basic methods and reasons for conducting an engineering economic study are presented. Economic criteria are developed. Procedures for making a selection from among a set of technically feasible alternatives are studied. Assumptions and implications associated with these decision-making procedures are discussed. *Prereq: 1/C engineering major or permission of chair.*

EN451 Analytical Applications in Ship Design (3-0-3). The design process and analytical tools required for effective decisions in the design of marine systems are studied. Methods for the analysis and transformation of available data are developed and evaluated. Once procedures for establishing the technical feasibility of a design have been addressed, emphasis shifts to the proper resolution of decisions dominated by economic considerations. *Prereq: 1/C standing as naval architecture major or permission of chair.*

EN452 Structural Reliability (3-0-3). Provides an understanding of the use of reliability methods to account for the random nature of the sea when designing ocean and ship structures. Methods for the reliability assessment of structures are presented. The role of reliability methods in the design of structures and as the basis for design codes is discussed. Case studies on the use of reliability methods provide the student with real world applications to complement theoretical studies. *Prereq: EN358 and EN455, or EN461 and EN475.*

EN454 Ship Vibrations (3-0-3). A ship is a complex elastic structure in which vibration may be caused by periodic forces generated by waves, propellers or machinery. The basic concepts of vibration, as well as hull, propeller and machinery-induced vibrations, are considered. *Prereq: EM232, EN353.*

EN455 Seakeeping and Maneuvering (3-2-4). Topics include ship steering, maneuvering, motion and seakeeping. The basic equations of motion for a maneuvering ship and for ship motions in a seaway are developed, and various methods of solution are discussed. The course also covers the experimental aspects of seakeeping and maneuvering. *Prereq: EN353.*

EN456 Advanced Methods in Ship Design (3-0-3). An introduction to computer-aided ship design is presented. Topics include numerical procedures applied to form, stability, resistance, propulsion, motion, maneuvering and strength. *Prereq: EN353 or permission of chair.*

EN457 Hydrofoil and Propeller Design (3-0-3). The analysis and design of hydrofoils and marine propellers are presented. Lifting line and lifting surface theories are applied to naval devices. Design and towing tank work supplements recitations. *Prereq: EN353 or permission of chair.*

EN458 Advanced Marine Vehicles (2-2-3). Modern watercraft discussed include multihulls, planing boats, hydrofoil craft, and surface effect vehicles. Analysis and design features are investigated experimentally in the towing tank when appropriate. *Prereq: EN353.*

EN461 Ocean Systems Engineering Design I (3-0-3). Engineering design is introduced as an interdisciplinary activity coupling such subjects as applied probability and statistics, cost assessment, decision-making, economic evaluation, engineering ethics, and project planning. Instruction in hydrographic surveying and profiling, computer-aided drafting, and design report preparation and presentation is also included. *Prereq: 1/C standing in ocean engineering major or approval of department chair.*

EN462 Ocean Systems Engineering Design II (1-4-3). Conceptual design of an ocean engineering system is accomplished by midshipmen teams. The realistic project

format followed involves proposal writing, project manager designation, project report, and design review by expert. *Prereq: EN461.*

EN470 Life Support Systems (3-0-3). The physiological and psychological aspects of man in the sea are presented with the related engineering requirements. Topics include hyperbaric physiology, saturation diving, life support equipment, deep dive systems, diving operations and hazards. *Prereq: 1/C engineering major or permission of department chair.*

EN471 Ship Design I (2-2-3). This course introduces the student to the requirements and procedures for accomplishing the design of a ship. The preliminary design of a small monohull displacement ship is developed. Relevant design resources and techniques are used. *Prereq: EN353 and EN358.*

EN475 Ocean Engineering Mechanics (3-2-4). Effects of gravity waves on surfaced and submerged floating bodies and on moored and fixed bodies. Measurement techniques discussed include measurements of wave height, wave-induced forces and motions in waves. *Prereq: EM318 or EM324, EN245 or permission of department chair.*

EN476 Ship Design II (0-6-3). In this course, which represents the culmination of an undergraduate naval architecture program, the student applies engineering skills to the design of a ship. *Prereq: EN471.*

EN478 Submarine Design Analysis (3-0-3). This course is offered to familiarize midshipmen with the naval architectural aspects of submarine design and to expose them to current design analysis methods for submarines. *Prereq: 1/C NAOE majors.*

EN479 Design of Floating Platforms (3-0-3). Utilizes the numerical methods available for the optimized design and configuration of various floating platforms, namely, catamarans, semi-submersibles, deep submersibles, drilling platforms, etc. *Prereq: EN245.*



Department of Weapons and Systems Engineering

Systems Engineering Major

Many modern products, from microwave ovens, stereos and automobiles to spacecraft, missiles and robots, are a complex system consisting of components from many engineering disciplines. The systems engineer seeks to combine and control the diverse components in order to meet specific design specifications.

The Naval Academy's systems engineering program, rated number one in the country for more than ten years, is accredited by the Accreditation Board for Engineering and Technology (ABET). It is an interdisciplinary major encompassing electronics, mechanics, automatic control, computers and simulation. An overall understanding of the analysis and design of complete engineering systems, including the interdisciplinary interfaces between systems, is the primary goal of the major. Systems engineering is particularly suited to those persons interested in the higher level interactions of engineering components rather than the detailed design of specific components. A bachelor of science in systems engineering is awarded.

Since most modern systems contain automatic control functions using digital control techniques, the core of the systems engineering major is the study of feedback control theory, with digital control as a major element. Surrounding this core is the interdisciplinary part of the major, with advanced courses in digital technology and microprocessors, computer interfacing and engineering, analog and digital communications, analog and digital simulation and robotics. As a part of the interdisciplinary concept, portions of the systems engineering major may be fulfilled with advanced courses from all other engineering disciplines as well as mathematics, physics and computer science.

A systems engineer is particularly well prepared to operate and maintain the most sophisticated systems found in today's Navy. Knowledge gained in the major is directly applicable to missile, gun, sensor, guidance and propulsion systems. The systems engineering major also provides an excellent foundation for postgraduate education in any engineering discipline.

Curriculum Requirements (in addition to the requirements of plebe year)

Professional: NE203, NL302, NL400, NN204, NS310, NS40X;

Mathematics: SM212, SM221;

Science: SP211, SP212;

Humanities: HH205, HH206 and two electives including one at the 300/400 level;

Engineering: EE331, EE332, EM211, EM232, EM318, EM319, ES300;

Major: ES202, ES301, ES302, ES307, ES308, ES401, ES402, SI283, SM314, plus five major electives.

Systems Engineering Courses

ES202 Introduction to Systems Engineering (2-2-3). Introduction to the mathematics, programming and simulation tools of the Systems Engineer. Introduction to analog and digital simulation techniques and modeling of electrical, mechanical and hydraulic systems. Includes a simulation project, a briefing from the I/C on design projects and a survey of the simulation and control laboratories and courses available in Systems Engineering. *Coreq: SM212.*

ES300 Naval Weapons Systems (3-0-3). An introduction to the theory of weapons systems through a study of the fundamental principles of sensor, tracking, computational and weapons delivery subsystems. *Prereq: SM122 or SM162, SP212 or SP222, SC112 or SC151 or SC122.*

ES301 Analog/Digital Computer Methods (2-2-3). Principles of computer simulation of linear and nonlinear multivariable systems are applied to the study of the behavior of realistic engineering control systems. Includes a hands-on hardware design and construction problem and a computer simulation design project. *Prereq: ES202; coreq: ES307.*

ES302 Applied Control Systems and Instrumentation (2-2-3). Computer controlled instrumentation is used to collect data for determination of mathematical model parameters of physical systems using statistical analysis. Comparisons of predicted and actual systems responses are made. Includes lab exercises with sensors, sensor operation and hardware design of DC and stepper motor controls. *Prereq: ES301, ES307; Coreq: ES308.*

ES307 Linear Control Systems I (3-0-3). A study of the dynamic behavior of physical systems through classical transform and modern state variable techniques. *Prereq: ES202; Coreq: ES301.*

ES308 Linear Control Systems II (3-0-3). Analysis and design of linear automatic control systems. *Prereq: ES307.*

ES310 Introduction to Weapons Systems (3-2-4). An introduction to weapons systems applications of communications, RADAR, electro-optics, SONAR, engagement

systems, destruction systems, and systems integration. *Prereq: SM122, SM230, SP212, SC112.*

ES320L Weapons Systems Laboratory Supplement (0-2-1). Topics in ES310 not covered in ES300. Exclusively for those who have taken ES300 and later require ES310 due to a change in major. *Prereq: ES300.*

ES401 Advanced Control Systems (2-2-3). A study of advanced topics of automatic control systems including compensation, modern control theory and nonlinear analysis and selected topics in research techniques. *Prereq: ES308 or ES410.*

ES402 Systems Engineering Design (2-4-4). Introduction to the macro-techniques of engineering design including performance, reliability, management control, redundancy, man-machine systems and testing techniques. Design, construction, test and evaluation of an approved project is accomplished in the lab. *Prereq: ES302, ES308.*

ES410 Control Systems and Their Application to Weapons (3-2-4). Linear control systems for engineering majors, using analytical, graphical and computer techniques. *Prereq: ES300, SM212 or SM222, EE221 or EE311 or EE331.*

ES413 Digital Control Systems (2-2-3). Analysis, design and simulation of digital filters. Analysis, design and laboratory testing of digital controllers for continuous processes using digital and analog computers and servo system hardware. *Prereq: ES308 or ES410.*

ES415 Nonlinear Control Systems (2-2-3). Analysis and design of control systems having nonlinear components. *Prereq: ES302, ES308.*

ES418 Modern Control Systems (3-0-3). Analysis and design of control systems using modern control theory. *Prereq: ES401 or approval of department chair.*

ES420 Weapons System Engineering (3-2-4). A study of the engineering principles used in the control of weapons systems, including modeling of physical systems, analysis and design. Applications include basic aerodynamic stability as applied to unmanned missiles and rockets. *Prereq: EE300, ES300 or ES310; Coreq: EN300.*

ES421 Digital Information Systems (2-2-3). Introduction to the tools required to study digital and analog communication systems including Fourier analysis, sampling, correlation, convolution and windowing. Analysis of different ways to encode digital communication signals. *Prereq: I/C engineering major or approval of department chair.*

ES422 Analog Information Systems (2-2-3). Study of amplitude and frequency modulation techniques. Develop models of receiver structures for extracting signals from a noisy environment. System identification of unknown black boxes using time and frequency domain techniques. *Prereq: ES421.*

ES430 Introduction to Computer Engineering (2-2-3). An introduction to logic operations starting with Boolean algebra and switching circuits up to an introduction of the logical organization and internal functioning of computers. Lab exercises include combinatorial logic design, sequential logic design, computer functional simulation and a three-chip computer project. *Prereq: none.*

ES432 Microcomputers in Control Applications (2-2-3). An introduction to the role of the microcomputer as a component in control systems, applying assembly language programming techniques and a variety of interface hardware. *Prereq: ES430 or approval of department chair.*

ES450 Introduction to Robotic Systems (2-2-3). Fundamentals of robotic systems including historical development, applications, basic configuration and design considerations, control principles of robot systems, computer vision processing and a group design project. *Prereq: 2/C engineering major or approval of department chair.*

ES452 Advanced Topics in Robotics (2-2-3). Individual and group open ended investigations of selected advanced topics in the field of robotics, such as: advanced computer vision processing techniques, multiple robot manipulator systems. Utilizes networked PCs, laboratory robots, computer vision systems. *Prereq: ES450 or approval of department chair.*

Division of Humanities and Social Sciences

Department of Economics

Department of English

Department of History

Department of Language Studies

Department of Political Science





Department of Economics

Economics Major

The major in economics is designed to acquaint prospective naval officers with both macro- and micro-economic theory, quantitative methods in economics, economic problem-solving in an institutional context and international economic relations of the United States. A bachelor of science degree is awarded. An honors program with a designated honors degree is available for selected students.

Curriculum Requirements (In addition to the requirements of plebe year)

Professional: NE203, NL302, NL400, NN204, NS310, NS40X;

Mathematics: SM223; plus either SM230 or SM239 or SM212;

Science: SP211, SP212;

Humanities: HH205, HH206 and two electives outside the major including one at the 300/400 level;

Language: Four semesters of a modern language;

Engineering: EN200, EN300; plus either EE300, ES310, ES420, and a free elective, or ES300, ES410, EE311, EE312;

Major: FE210, FE331, FE365, FE341, FE475, and five major electives.

Economics Courses

FE210 Introductory Economics (3-0-3).

An introductory course in elementary economic theory and its application to contemporary problems. Topics include income determination, monetary policy and institutions, fiscal policy, price theory and international trade. *Prereq: none.*

FE220 Accounting (3-0-3). An introductory course in the basic principles of accounting. Cannot be taken for humanities/social science credit. *Prereq: none.*

FE301 Financial Analysis (3-0-3). A study of the theory and techniques of financial analysis applied in the federal government and industry. *Prereq: FE210.*

FE310 Economic Geography (3-0-3). Provides a systematic understanding of economic growth and the issue of finite limits to improved living standards around the world. Studies population growth, the resources of the principal nations of the world, industry location, international trade, commodity cartels and the requirements for continued technological advances. *Prereq: FE210 or permission of chair.*

FE311 History of Economic Thought (3-0-3). Traces the evolution of economic doctrine from the ancients to modern day with emphasis on the period since the 18th century. Reviews the contributions to economic knowledge by Smith, Malthus, Ricardo, Marx, Mill, Marshall, Keynes and others. Various schools of thought, including mercantilism, classical, neo-classical, historical, institutionalism and Keynesianism are examined. *Prereq: FE210.*

FE314 International Trade Policy (3-0-3). Study of trade policy and the institutions that shape trade policy; among topics covered are exchange rate regimes; role of the World Bank and IMF; trade intervention in the form of tariffs, quotas, voluntary exchange restraints and anti-dumping duties; multilateral free trade agreements and regional trade agreements such as NAFTA, APEC and the European Union. *Prereq: FE210 or FE210.*

FE315 Economics of Developing Nations (3-0-3). Study of the economic characteristics, problems and policies of developing nations, covering economic growth patterns in Third World nations, their changing role in the international economic order and the different economic routes being employed toward economic progress. *Prereq: FE210.*

FE320 Cost Accounting (3-0-3). A study of concepts and techniques of cost accounting. Primarily concerned with the derivation of production cost arising from materials, labor, services employed and overhead. Cannot be taken for HUM/SS credit. Not offered every year. *Prereq: FE220.*

FE321 Comparative Economic Systems and Transitional Economies (3-0-3). The study of the structure and performance of alternative forms of economic organization – capitalist, socialist/communist and mixed systems, and the study of the conversion of socialist systems to capitalism with particular focus on eastern European countries and the former Soviet republics. Not offered every year. *Prereq: FE210.*

FE331 Economic Statistics (2-2-3). Survey of descriptive and inferential statistical techniques involving more than one variable. Strong emphasis on regression analysis and use of computers. *Prereq: FE210 and SM230 or SM239.*

FE334 Financial Markets and Institutions (3-0-3). A study of financial institutions and instruments covering their development and role within the economy and financial system. The forces creating the rapid changes of financial institutions and instruments in the 1980s and 1990s are explored, as well as the regulation of financial institutions and markets. *Prereq: FE210 or permission of chair.*

FE335 Economics of National Defense (3-0-3). The application of economic analysis to defense decision-making and the consequences of defense decisions for weapons; volunteers vs. conscription; leaders vs. resource managers; competitive vs. monopoly contractors; pay vs. non-pay factors in reenlistment. *Prereq: FE210 or permission of chair.*

FE337 Economics of the Defense Industrial Base (3-0-3). Application of economic principles to issues relating to military procurement and contracting, conversion of military industrial capacity to peacetime uses, wartime mobilization of industrial capacity, strategic stockpiling and economic warfare. *Prereq: FE210.*

FE341 Microeconomics (3-0-3). Theories of the economic behavior of consumers and producers, the determination of final good and factor prices, market structures and general economic equilibrium. The application of price theory to business problems and public-policy issues. *Prereq: FE210.*

FE342 Economic Methods for Engineers (3-0-3). Application of microeconomic principles and analytical tools to the costing of investment projects in both private and public/military contexts. *Prereq: FE210.*

FE345 Environmental Economics (3-0-3). Economic evaluation of policies involving conflicting public and private uses of natural resources. Topics include environmental benefit and cost measurement, causes and consequences of pollution, management of depletable and renewable resources and the economics of energy. Not offered every year. *Prereq: FE210.*

FE354 Development of the U.S. Economy (3-0-3). Economic theory is used to analyze the evolution of the U.S. economy; among topics considered are the American Revolution, westward expansion, slavery, industrialization, market concentration and the Great Depression. *Prereq: FE210 or permission of chair.*

FE361 Urban Economics (3-0-3). Study of economic growth and structure, and economic problems of cities, with attention to poverty, transportation, housing and racial discrimination. Not offered every year. *Prereq: FE210.*

FE362 The Economics of Technology (3-0-3). An analysis of productivity growth, characteristics of invention and innovation, determinants of research and development activities of government and business; the economic impact of automation and reindustrialization. Not offered every year. *Prereq: FE210.*

FE365 Macroeconomics (3-2-4). A course on the theories of the aggregate level of income, employment and the price level. Includes discussion of determinants of economic growth, the interaction of the domestic economy with the world economy, and the formulation and impact of monetary and fiscal policy. Laboratories involve work with a large macroeconomic model. *Prereq: FE210.*

FE400 Advanced Microeconomic Theory (3-2-4). Advanced topics in modern microeconomics with particular emphasis is on dynamic analysis, the role of risk and uncertainty in economic decision making, general equilibrium analysis and welfare economics. *Prereq: FE331, FE341 and FE412 or FE422 or FE431 or FE434 or FE460.*

FE401 Quantitative Economic Techniques (3-0-3). Quantitative approach to theoretical and applied economic problems. Methods taught include order quantity models, linear programming, network models, microeconomic resource allocations, macroeconomic models, life cycle cost problems and cost-benefit analysis. Not offered every year. *Prereq: FE341.*

FE405 Advanced Macroeconomic Theory (3-2-4). Advanced topics in modern macroeconomics, including new classical, new Keynesian and expectation formation models. Introduction to macro dynamics, business cycle and growth models. Emphasis on empirical macro models. *Prereq: FE365, FE331, FE341 and FE412 or FE422, or FE431 or FE434 or FE460.*

FE412 International Trade and Finance (3-0-3). A rigorous examination of current international issues in a theoretical and empirical framework. Topics include motivations for trade; trade versus protectionism; the multinational enterprise; exchange rate issues and the international monetary systems, and the role of the International Monetary Fund and World Bank. *Prereq: FE365 or FE341.*

FE422 Labor Economics (3-0-3). A study of the distribution of income with emphasis on the demand for and supply of labor services; the choice-theoretic behavior of firms and individuals in the determination of wages and the employment level. Topics analyzed

include human capital theory, occupational choice, the unemployment-inflation relationship and the wage effects of discrimination and unions. *Prereq: FE341.*

FE431 Public Finance (3-0-3). The use of government expenditures and taxation in a market economy to change the allocation of resources and to modify the distribution of income. Examination of the economic effect of government budgetary policy. Microeconomic theory and federal tax and budgetary institutions are emphasized. *Prereq: FE341.*

FE434 Money and Banking (3-0-3). A consideration of central and commercial banking institutions; an investigation of the demand for money and its role as a focal point for monetary policies designed to obtain full employment, price stability and international monetary equilibrium. *Prereq: FE365.*

FE445 Econometrics (3-0-3). Quantification of basic economic theory; multiple regression, correlation and identification techniques for the construction and testing of economic models and a study of selected alternative models of particular economic interest. *Prereq: FE331 or SM339, FE341 and SM122 or SM162.*

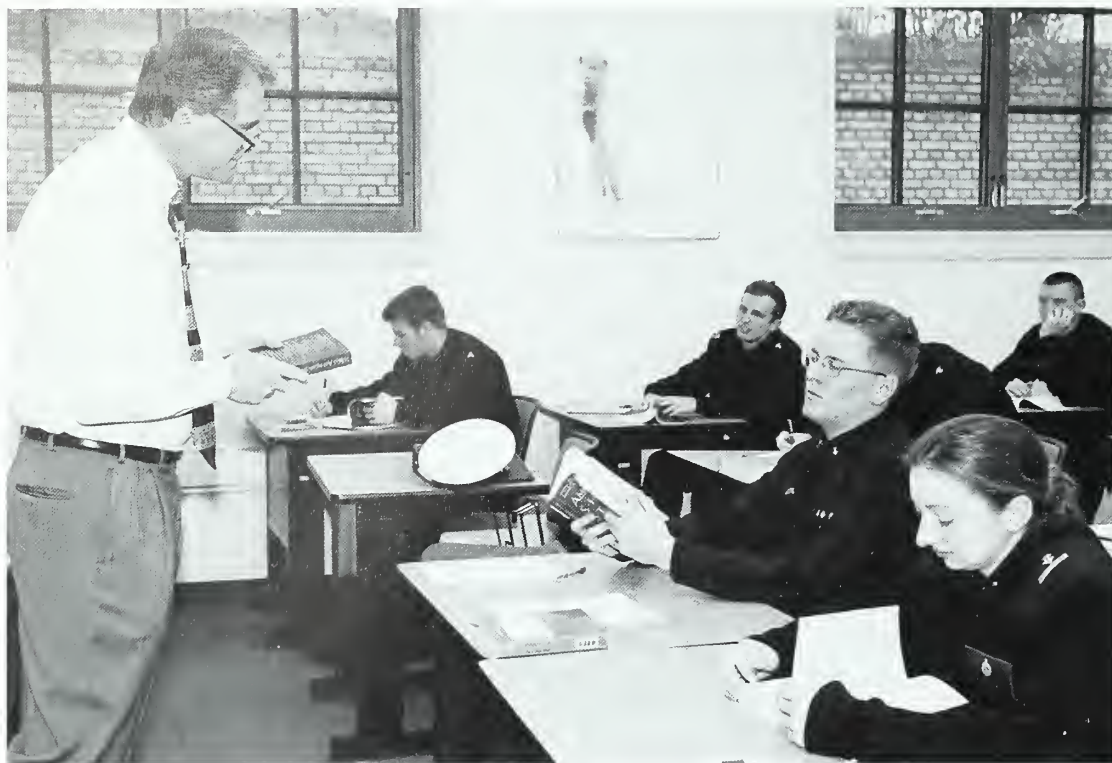
FE460 Public Policies Toward Business (3-0-3). An examination of public regulation of private enterprise in the U.S. with emphasis on the rationale for and application of antitrust policy and direct regulation. *Prereq: FE341.*

FE475 Research Seminar (3-0-3)
Directed research on a specific topic capstone to economics major. Emphasis on empirical work using computer. *Prereq: 1/C FECH major.*

FE500 Honors Research Seminar I (2-0-2)
Examination of techniques and methodology of social science research; students will choose topics for development in FE506. *Prereq: 1/C FECH major.*

FE506 Honors Research Seminar II (3-2-4). Directed independent research on topics chosen in FE500. Emphasis on empirical work using microcomputers. *Prereq: 1/C FECH major.*





Department of English

English Major

The majors program in English offers study of the most significant and influential writings of civilization from ancient times to the present as well as the opportunity for independent study and for creative writing projects. A bachelor of science degree is awarded.

An honors program with a designated honors degree is available for selected students. Built on the premise that students wishing to excel will do so within the framework of the regular major, the honors program requires rigorous concentration in literary period courses, through special seminars focusing on literature and the fine arts and on special topics studied in depth.

In addition to the honors program, midshipmen may take advantage of the Trident Scholar program, study abroad, poetry and playwriting competitions and the English Majors' Club. The department of English also arranges a full schedule of trips to cultural centers in Washington and Baltimore to take advantage of musical and dramatic offerings. For those inclined to be on the stage themselves, the Masqueraders, a highly regarded drama group, offers a major production each year.

Choosing a major in English will not limit career selection in a highly technical Navy or Marine Corps. The qualities of a superior officer must include creativity, communicative skills and independent thinking, all of which are strongly encouraged in English classrooms.

Curriculum Requirements (In addition to the requirements of plebe year)

Professional: NE203, NL302, NL400, NN204, NS310, NS40X;

Mathematics: SM223; plus either SM230 or SM212;

Science: SP211, SP212;

Humanities: HH205, HH206 and two electives outside the major including one at the 300/400 level;

Language: Four semesters of a foreign language;

Engineering: EN200, EN300; plus EE300, ES310, ES420, and a free elective, or ES300, ES410, EE311, EE312;

Major: Ten major electives.

English Courses

HE101 Practical Writing (3-0-3). The study and practice of grammatically correct and rhetorically effective expository prose, supplemented by the analysis of essays by professional writers. For students selected by English Department.

HE111 & 112 Rhetoric and Introduction to Literature I & II (3-0-3 & 3-0-3). Stresses the writing of rhetorically effective and grammatically correct expository prose. During the first semester students read essays, short stories and plays, and they write brief essays. During the second semester students read novels and poetry and write longer essays. *HE111 Prereq: None & HE112 Prereq: HE111.*

200-Level Courses: General Description

The literary content of courses on this level is eclectic. These courses offer wide surveys of materials from different cultures, historical periods, literary types and issues. In each course substantial practice in writing is to be expected. If a term paper is required, prior to the submission of such a paper there will also be several essays or written exercises to test and evaluate the student's writing competence. There are no prerequisites for any course in the 200 group. They may be taken at any class level, including the fourth-class year.

HE217 Western Literature I (3-0-3). A balanced survey of the Western literary tradition and its backgrounds, from the ancient Greeks through the Renaissance. Readings will include classical Greek and Roman epic, drama and philosophy (typically Plato and Aristotle); selections from the Old and New Testaments; medieval poetry, drama and philosophy (especially Dante and/or Chaucer); and Renaissance poetry, non-Shakespearean drama and prose.

HE218 Western Literature II (3-0-3). A balanced survey of the Western literary tradition and its backgrounds, from the Enlightenment through Romanticism to the various reactions to Romanticism beginning in the mid-nineteenth century, most notably realism, naturalism and modernism and its aftermath.

HE222 The Bible and Literature (3-0-3). The Bible and its influence on European and American literature. Emphasis will be placed on modern biblical literary-critical methodology and on the symbolic richness of derivative literature from Dante to Nikos Kazantzakis.

HE224 Literature and Science (3-0-3). The interrelationships among science, technology and literature since the Renaissance. The impact of science on literature and the implications of science as reflected in literary responses.

HE240 American Black Literature (3-0-3). Provides a survey of representative American black literature. Major figures including Toomer, Hughes, Wright, Ellison, Baldwin, Baraka, Brooks, Hayden and Morrison are stressed. The genres of short fiction, poetry, drama and the novel are covered.

HE250 Literature of the Sea (3-0-3). Study of the principal genres of the literature of the sea (epic, novel, short fiction and poetry). Emphasis on literary qualities, human relationships with the sea and problems of command.

HE260 Literature of War (3-0-3). A multi-genre survey of war and its consequences as represented in classic and contemporary literature with an emphasis on such issues as individual responsibility, societal values, military culture, and the ways in which literary expression voices and shapes the collective memory of experience and history.

300-Level Courses: General Description

These courses build on the foundations of literary analysis, comprehension and writing acquired in HE111-112. The HE301-306 series goes more deeply into each of the basic literary types; the HE313-333 series approaches literature in its historical and cultural dimensions while focusing on a limited historical period; the HE343-344 series offers extensive practice in a variety of writing forms. All courses have a writing requirement intended to further the student's opportunity to improve skills. *Prerequisites for all 300-level courses are HE111-112.*

HE301 Patterns in Drama (3-0-3). Reading, viewing and analysis of a variety of dramatic experiences for the purpose of exploring the relationships among language, action and form.

HE302 Forms of Poetry (3-0-3). An examination of the variety of techniques by which language is shaped into poetry. The focus is on analytic methods for understanding poetry.

HE306 Types of Fiction (3-0-3). Ideas and issues of fiction, with particular emphasis on the conventions, techniques, forms and innovations of the novel and short story.

HE307 Topics in Film and Literature (3-0-3). A study of American, European and world films in conjunction with literary products related to them.

HE313 Chaucer and His Age (3-0-3). The literary and philosophical traditions within which Chaucer and his contemporaries worked. Readings in Chaucer's works, the Gawain poet and others, including early and late medieval writers from England and the continent.

HE314 The Renaissance Mind (3-0-3). Literature and thought of the period bracketed by the two great English epics, Spenser's *Faerie Queene* and Milton's *Paradise Lost*. The course includes a continental perspective, with readings from such authors as Machiavelli, Rabelais, Cervantes, Montaigne and Castiglione.

HE315 Satire and Sensibility in the Age of Reason (3-0-3). The literature of the Enlightenment (1660-1780). Readings from the prose and poetry of Dryden, Swift, Pope, Addison and Steele, Johnson and Boswell as well as selected novels and such continental writers as Voltaire.

HE317 The Romantic Vision (3-0-3). Concentrates on how writers from 1798 to 1837 responded to the growth of industrialism, religious skepticism, nationalism and a host of other problems associated with modern life. Readings in representative works of the Romantic period. Readings from such continental writers as Goethe and Novalis may be included.

HE318 Modern British Literature (3-0-3). The literature of Great Britain and Ireland of the past hundred years. The novels of Hardy, Conrad, Joyce, Lawrence, Golding and Lessing; the plays of Shaw, Synge, O'Casey and Pinter; the poetry of Yeats, Eliot, Auden and Dylan Thomas.

HE319 The Victorian Frame of Mind (3-0-3). A study of the literature of England written during the last seven decades of the 19th century. Emphasis on writings that deal with the growth of religious skepticism, the rise of the middle class, general education and the increasing dehumanization of the individual in a society caught up in a new wave of scientific discovery and technological progress. Readings from representative figures such as Dickens, George Eliot, Hardy, Tennyson, Browning, Arnold, Ruskin, Carlyle and Darwin.

HE326 Literature of the American Dream, 1620-1860 (3-0-3). A survey of American literature from the time of the Pilgrims to the outbreak of the Civil War. Emphasis is on the relationship between the emerging culture and literature.

HE328 America's Literary Coming of Age (1860-1920) (3-0-3). A study of American literature from the Civil War to the development of the United States as a major industrial and military political power after World War I. Focus is on the American writer's response to his or her own culture and to that of the broadening world.

HE329 Modern American Literature: The 20th-Century Challenge (3-0-3). A study of American literature from 1910 to 1945 with emphasis on the writer's interpretation of the complexities of 20th-century life.

HE330 Contemporary American Literature: World War II to the Present (3-0-3). Concentrates on responses of contemporary writers to the idiosyncratic problems and themes of the post-World War II era such as the nuclear age, computer technology, television, the Vietnam experience, racial questions, the debasement of the language and environmental issues.

HE333 Shakespeare and His Contemporaries (3-0-3). A study of Elizabethan and Jacobean ideas and attitudes through the investigation of a representative sample of Shakespeare's tragedies, histories and comedies as well as a few plays by contemporaries of Shakespeare.

HE343 Creative Writing (3-0-3). After completing initial problem-solving exercises in prose, poetry and drama, students embark upon an approved project of their own design. Criticism of students' work is accomplished through classroom workshops and individual conferences with the instructor.

HE344 Professional Writing (3-0-3). Designed for students interested in advanced methods of preparing writing and presenting articles and reports. After initial study and analysis of the form and style in a wide variety of prose writing and practice in various prose forms, students will design and present independent projects.

HE360 Special Topics in Literature (3-0-3). An open-topics literature course. Topics vary from semester to semester and include such offerings as myth and fantasy, literature of American minorities, science fiction and images of women in literature.

400-Level Courses: General Description

The HE400 series allows students and English department faculty members with special expertise to pursue together an intensive study of a restricted literary subject. Emphasis in each course will be upon extensive and intensive reading in a limited body of material, techniques of research and the development of independent critical judgment. *Prerequisites for these courses are at least one 300-level English course and permission of the chair.*

HE442 Introduction to Literary Criticism (3-0-3). The theory and practice of literary criticism. Concentrates on what critical approaches can yield to the reader in the way of deeper understanding and satisfaction from the work of art. Required of all honors English majors.

HE461 Studies in a Literary Period (3-0-3). In-depth study of a limited period in literary history. For example: Pope and his literary contemporaries, the beginnings of Romanticism, the American Renaissance (1830-1860) and the 1920s in American literature.

HE462 Studies in a Literary Problem (3-0-3). Cutting across traditional divisions of nationality, historical period or genre, the materials of this course will be selected to focus on some timeless problem of literature and the human existence it reflects. For example, myth and symbol in literature, literature and science, the concept of the hero.

HE463 Studies in Literary Figures (3-0-3). Extensive reading in the works, biography and criticism of major figures in world literature. Among those studied are Milton, Wordsworth, Dickens, Joyce, D.H. Lawrence, Melville, Twain, Faulkner, Dostoevsky, Thomas Mann. No more than three such writers will be considered in any one semester.

HE467 Studies in a Literary Genre (3-0-3). Study in a special genre. For example, the epic, the autobiographical novel, science fiction, imagist poetry.

HE506 Seminar in Arts and Literature (3-2-4). This interdisciplinary course introduces students to Western art and music, showing how the arts in any age reflect the corresponding philosophical and scientific theories and mirror the ideals and realities of their representative cultures.

HE507 Advanced Topics (3-2-4). This course for English honors students offers concentrated exploration of individual literary masterpieces or issues.



Department of History

History Major

The major in history provides an opportunity to examine the evolution of past civilizations and to evaluate and understand the institutions, achievements, ethics and values of mankind through the ages. History majors learn to evaluate ideas critically: to sift evidence, to draw conclusions and to express their conclusions clearly and concisely. A clear understanding of the events of the past provides a more acute awareness of contemporary issues and problems, as well as a context and a process for evaluating those problems. The program includes introductory courses on the values and ideas of Western civilization and on the historical role of the U.S. Navy and Marine Corps. Majors will select upper-division courses from the field of American, European, non-Western and naval and military history. A bachelor of science degree is awarded.

In addition to the three history courses in the core curriculum (HH104, HH205 and HH206), each history major will also take Perspectives on History (HH262) and a Seminar in Advanced Historical Studies (HH462). These courses introduce the students to historiography and the techniques of historical research and writing and enable them to pursue a historical issue in depth. The department also requires each history major to take at least one American history course, one European history course, one cross-national course and one regional course from among those listed below.

The honors program in history offers a student with above-average ability and ambition an opportunity to pursue a more challenging curriculum and to earn an honors degree. Those accepted for the program will follow the normal history major, with the following exceptions: they will take two Honors Colloquia (HH507 and HH508 in second class year) in place of two history electives; and they will take an Honors Research Seminar (HH509 in the fall of first class year). Each honors student will also write a major research paper.

Curriculum Requirements (In addition to the requirements of plebe year)

Professional: NE203, NL302, NL400, NN204, NS310, NS40X;

Mathematics: SM223; plus either SM230 or SM212;

Science: SP211, SP212;

Humanities: HH205, HH206 and two electives outside the major including one at the 300/400 level;

Language: Four semesters of a foreign language;

Engineering: EN200, EM300; plus either EE300, ES310, ES420 and a free elective, or ES300, ES410, EE311, EE312, ES410;

Major: HH262, HH462, and eight major electives.

History Courses

HH104 American Naval Heritage (3-0-3).

This course examines the antecedents, origins and development of the United States Navy within the framework of America's growth as a continental and, eventually, global power, with particular emphasis on the development of naval and maritime strategy.

HH205 Western Civilization: Culture, Ethics and Society to 1776 (3-0-3).

Analyzes the historical evolution of ethical thought and its impact upon European politics and culture from the Classical Age to the Enlightenment. Given that a society's culture expresses the ethical concerns, ideals and aspirations of its members, this course approaches the development of Western civilization to 1776 through a study of its ideas and institutions. By studying the critical moral and practical choices made by societies and individuals through the ages, this course examines the ethical legacy of the past in order to illuminate and deepen the student's understanding of the values and institutions of contemporary Western society.

HH206 Civilization and the Atlantic Community: Culture, Ethics and Society Since 1776 (3-0-3). Pursues the study of Western values and ideas from the American Revolution to the present. In this course, the intellectual and ethical legacy of Europe is examined as a major influence upon the development of American culture. Particular emphasis is placed on the impact of Enlightenment ideas on the American and French revolutions (including an examination of the U.S. Constitution), the impact of the Industrial Revolution on the values and ideas of Western society and on the integration of the West with the world in the 20th century.

HH262 Perspectives on History (3-0-3).

A methodology course in which majors acquire the basic technical skills required for research and writing in subsequent courses in history and other humanities and social sciences disciplines.

Prereq: 3/C HHS major.

HH311 Athens: Military Democracy

(3-0-3). Examines the origins of Western democracy in 5th-century B.C. Athens. Focus is on the problems of democratic constitutions in settling foreign policy, surviving extended wars, administering foreign territories and dealing with questions of inequality at home.

HH312 Imperial Rome (3-0-3). Study of the most successful of Western states with emphasis on models for bureaucratization, military defense and the incorporation of various ethnic groups.

HH315 The Age of Chivalry and Faith (3-0-3). Surveys the history and culture of Western Europe between about A.D. 1050 and about A.D. 1300, the period generally known as the High Middle Ages. The course traces the emergence of two self-defined medieval aristocracies: those who fight (the knighthood) and those who pray (the Christian clergy). Special attention is paid to developments in the socio-political systems of the age, kingship and lordship; to the culture of the medieval aristocracy, chivalry; to movements of religious enthusiasm; and to the evolution of the Catholic Church into a papal monarchy.

HH316 Age of Religious Wars (3-0-3). Focuses on the emergence of modern civilization (1500-1763) from the discoveries and rediscoveries of the Renaissance, the sweeping changes brought by the Reformation and Counter-Reformation and the excitement of both scientific and political revolution.

HH318 War and Society in Modern Europe (3-0-3). A study of the origins and consequences of war on European society. The societal response to both total and cold war is assessed. War is examined as a force promoting change, including responses ranging from fascism through European economic unity.

HH321 Revolutionary Russia – Peter the Great to Lenin (3-0-3). A study of Russian history from the founding of Moscow to 1917, examining the domestic and external forces responsible for shaping the structure of Russian society and culture.

HH322 The Rise and Fall of Soviet Communism (3-0-3). An examination of the Revolution of 1917 and the development of the Soviet Union, emphasizing the institutions and policies adopted to meet domestic and foreign problems.

HH327 Germany and the Nazi Experience (3-0-3). Focuses on the antecedents of National Socialism, including the Second Reich and World War I eras, the Nazi experience itself, and the legacy it bequeathed to today's German state.

HH329 Modern France: Napoleon to DeGaulle (3-0-3). This course examines France from the revolutionary upheaval of the late 18th century through its role in the Western world since World War II. Roughly the first half of the course will deal with the revolutions of 1789 and 1792 and their impact upon 19th-century France. The second half of the course will consider the experience of France in the 20th century and the changes forced upon the nation by two world wars fought on French soil.

HH330 Imperial Encounters (3-0-3). Great Britain from 1750 to the present. Begins with an analysis of Britain's political and social institutions. It then examines the changes brought about by industrialization at home, revolutions abroad and expansion of the empire. At its end, the course highlights the simultaneous eclipse of Britain as a world power and the increasing prosperity of the masses of the British people.

HH331 Art and Ideas in Modern Europe (3-0-3). Explores the transformation of culture in the modern world. Examines how artists and intellectuals reacted to the long-range impacts of the democratic and industrial revolutions. Emphasis is placed on development of the fine arts in relation to pivotal ideas from 1750 to present. *Prereq: HH206.*

HH345 Colonial America (3-0-3). Examines the ways in which three diverse cultures—Indian, European, and African—converged on the North American land mass before the American Revolution; topics include French, Spanish and English exploration and settlement patterns, European-Indian encounters, gender, witchcraft, religion, slavery and race, the family, political ideas and institutions, and war and warmaking.

HH346 Revolutionary America and the Early Republic (3-0-3). Covers the remarkable transformation in American society from 1760 to 1820 as thirteen separate and distinct colonies struggled ideologically, militarily and politically to establish a governmental and social system that would suit the needs of a large, diverse, and rapidly expanding population. The background to the Revolution, the actual conduct of the war and the construction of state and national governments are treated in detail.

HH347 Civil War, Reconstruction and the Gilded Age, 1845-1896 (3-0-3). An examination of the political, economic and social developments from the origins of the Civil War to 1896, including the wounding of the nation in a civil war and the subsequent reunification.

HH349 Emergence of Modern America 1896-1945 (3-0-3). Examination of political, social, intellectual, diplomatic and economic aspects of American history from the Spanish-American War to the end of World War II. Special emphasis is placed on Progressivism, the emergence of the U.S. as a great power in World War I, the Depression and the New Deal, and World War II.

HH350 United States Since World War II (3-0-3). A detailed examination of American history since 1945, including the onset of the Cold War in the 1950s, the domestic and foreign policy issues of the 1960s, Vietnam, Watergate and the Reagan era.

HH352 Film and American Society (3-0-3). This course explores the relations between motion pictures and the political/cultural life of a selected period. Films are studied as documents of an era and the extent to which they offer insights for historical understanding are considered.

HH353 American Social History (3-0-3). An examination of the evolution of American society from the perspective of private life and an evaluation of the influence of group identifications—class, race, gender and ethnicity. Other topics include consumerism, sports, religion and wars as factors that modify and enrich the social and cultural spectrum.

HH354 America in World Affairs (3-0-3). Surveys U.S. foreign relations from the colonial era to recent times, focusing on America's transformation from a colony to a preeminent world power. Examines the causes and international consequences of this dramatic shift, with particular emphasis on the twentieth century—the era of America's greatest influence on world affairs.

HH355 Art and Ideas in American Society (3-0-3). Examines the growth and development of intellectual concepts and artistic creativity in America from colonial times to the present. Emphasizes both the peculiarities of American creative and intellectual accomplishments and the place of those achievements in the broader Western tradition.

HH359 U.S. Sectional History: The West (3-0-3). Deals with the opening of the trans-Mississippi frontier. Topics emphasized include land policy, railroads, Indian wars and water policy.

HH360 U.S. Sectional History: The South (3-0-3). Surveys the growth and development of the American South with specific attention to the plantation economy and slavery, the Confederate experience, the rise of segregation and the Second Reconstruction.

HH361 History of East Asia (3-0-3). An analysis of contemporary Asian problems which considers their cultural and institutional origins, their 19th-century development under the impact of Western influence and their culmination in contemporary Asian nationalism.

HH362 History of the Middle East (3-0-3). A long-range historical approach to the Middle East's role in world affairs and the development of its cultural, political and military institutions. Emphasis is placed on strategic and diplomatic considerations.

HH363 Pre-Columbian and Iberian Empires (3-0-3). Pre-Columbian empires like the Olmec, Maya, Aztec, and Inca are studied through examinations of their cosmologies, styles of warfare, expansion, imperial consolidation, and collapse. Spanish and Portuguese conquests in America will also be studied by focusing on military campaigns, imperial policies, race, ethnicity, slavery, and church-state relations through the Independence Era.

HH364 History of Africa (3-0-3). A survey of social, cultural and political development on the African continent from the era before European colonization to the present.

HH365 Modern Latin America (3-0-3). The evolution of Latin American societies from independence to the present will be studied. Analyses of social and political issues like slavery, race, immigration, popular religion, militarism, dictatorship, and revolution will be the focus of the course. Particular emphasis will be placed on Argentina, Mexico, Brazil, Peru, Chile, and Cuba.

HH366 Comparative World Cultures (3-0-3). A team-taught course introducing students to the comparative study of Non-Western societies and cultures before and during their initial contact with the West.

HH367 Topics in Regional History (3-0-3). A variety of specialized themes or eras in Non-Western history which are too unique or unusual to be integrated into the regular curriculum are selected for detailed analysis. Subjects vary from semester to semester and midshipmen are permitted to take only one "Regional Topics" course for academic credit.

HH377 Topics in Thematic History (3-0-3). A variety of historical themes dealing with long term developmental processes will be submitted to detailed analyses. Subjects vary from semester to semester and are often team-taught. Examples of the kinds of themes to be studied are the process of modernization, the development of national identities, capitalism, and the sense of self. Midshipmen are permitted to take only one "Thematic Topics" course for academic credit.

HH380 History of Science and Technology (3-0-3). A survey of the history of scientific discoveries and their practical applications, from the early natural philosophers to the present, with emphasis on the scientific revolution of the 17th century, the Industrial Revolution and the information explosion of the 20th century.

HH381 The Martial Heritage to 1500 (3-0-3). Examines the development of tactics, strategy and military organizations from the Greek hoplite armies through the advent of gunpowder in the West. Places these developments in their social and economic context.

HH382 Warfare from the Renaissance to Napoleon (3-0-3). Examines the theory, practice, and nature of warfare on land and sea, both in Europe and European colonies, from about 1500 through the Wars of the French Revolution and Napoleon. Tactical, logistical, technological, and professional developments of Western armies and navies are studied in their political, economic, and social contexts.

HH383 The Age of Total War, 1815-1945 (3-0-3). Surveys the dimensions of warfare and civil-military relations from the end of the Napoleonic era through World War II.

HH384 Recent Military and Naval History (3-0-3). Surveys the dimensions of warfare and civil-military relations from the end of the World War II to the present.

HH385 The U.S. Marine Corps (3-0-3). The historical development of the U.S. Marine Corps is examined by tracing the evolution of its roles and missions, organization, capabilities, and institutional culture. Emphasis is placed on how the Marine Corps has perceived its role in American Society, and how it has been perceived by American society.

HH386 Topics in Naval/Military History (3-0-3). A variety of specialized themes or eras in naval/military history which are too unique or unusual to be integrated into the regular curriculum are selected for detailed analysis. Subjects vary from semester to semester, and midshipmen are permitted to take only one "Naval/Military Topics" course for academic credit.

HH462 Seminar in Advanced Studies (3-0-3). Offers midshipmen with a solid base in historical studies an opportunity to pursue the discipline at a level of greater sophistication. Taught in small, intensive seminars; individual sections will engage in a detailed examination of a selected historical topic. Each section will focus on a particular event or problem in history and on the interpretative debates surrounding it. *Prereq: 1/C HHS major, or permission of department chairman.*

HH507 Honors Historiography (3-2-4). Focusing on the interpretive debates surrounding a particular event or problem in history, students will learn to critically evaluate secondary texts, to discriminate between conflicting interpretations, and to make judgments regarding the merits of different analyses. *Prereq: Admission to the honors program in history.*

HH508 Honors Colloquium (3-2-4). Students will propose, conceptualize, and refine their 1/C independent research projects. In the process, they will test different historical interpretations, and evaluate different philosophies of history. They will submit a series of short essays culminating in a precise specifying both the topic of their Honors research projects and the arguments these projects will advance. *Prereq: HH507.*

HH509 Honor Senior Thesis (3-2-4). With the guidance of a faculty advisor, students prepare analytical research papers interpreting an historical topic of their choice. Each student makes an oral presentation of the finished paper before the faculty-student Honors Committee and external readers. *Prereq: HH507, HH508.*

HH512 Honors Thesis Readings (2-0-2). After selecting a research topic and advisor, history honors students will engage in intensive reading of primary and secondary works related to the topic. *Prereq: HHSH major.*





Department of Language Studies

Language Studies Minors

The department offers courses at all levels in French, German, Japanese, Russian and Spanish. Midshipmen majoring in economics, English, history or political science must complete or validate a total of four semesters of a given language and may continue their study of a foreign language at the advanced levels or begin a new language. In other majors, midshipmen who validate a year or more of a language may take language courses at the 200, 300 or 400 levels in that language as humanities or social science electives or as a free elective. The department also offers minors in French, German, Spanish, Russian and Japanese. In French, German and Spanish the minor consists of 12 credit hours at the 300/400 level taken or validated at the Naval Academy. In Russian and Japanese, students may count courses at the 200 level towards the minor.

Among the special features of foreign language study at the Naval Academy are state-of-the-art interactive computer-video and audio laboratories for intensive practice with native-speed speech in the target language and outstanding satellite reception facilities for viewing television programs from Latin America, Europe and Russia. There are also extraordinary opportunities for summer overseas language study under the auspices of the Captain Marshall H. Cox Fund.

French Courses

FF101 & FF102 Basic French I & II (3-0-3 & 3-0-3). Develops basic communicative skills, with an emphasis on speaking and listening comprehension. *FF101 Prereq: None & FF102 Prereq: FF101.*

FF201 & FF202 Intermediate French I & II (3-0-3 & 3-0-3). Continues development of oral, reading, and writing skills using real-life situations. Emphasizes practical, everyday culture of French-speaking world. *FF201 Prereq: FF102 & FF202 Prereq: FF201.*

FF301 & FF302 Advanced French with Civilization Readings I & II (3-0-3 & 3-0-3). Develops fluency in conversation and facility in reading and writing. Topics emphasize main aspects of French civilization. *Prereq: FF202.*

FF411 Development of French Civilization (3-0-3). From the origins to World War II. *Prereq: FF302 or approval of department chair.*

FF412 Modern France (3-0-3). All aspects of contemporary France: geography, economy, institutions, society, politics and culture. *Prereq: FF302 or approval of department chair.*

FF421 & FF422 Representative Readings in French Literature I & II (3-0-3 & 3-0-3). Class discussions of works by leading writers of various periods. Program includes film versions of several titles. Taught in French. *Prereq: FF302 or approval of department chair.*

German Courses

FG101 & FG102 Basic German I & II (3-0-3 & 3-0-3). Emphasizes the spoken language. *FG101 Prereq: None & FG102 Prereq: FG101.*

FG201 & FG202 Intermediate German I & II (3-0-3 & 3-0-3). Continues development of oral, reading and writing skills. Includes area and cultural topics. *FG201 Prereq: FG102 & FG202 Prereq: FG201.*

FG310 Introduction to Contemporary Germany (3-0-3). An introduction to the geography and political, economic and social systems of the Republic of Germany, in German. Stresses development of advanced German language skills. *Prereq: FG202.*

FG320 Introduction to German Literature (3-0-3). In German. Stresses development of advanced German language skills. *Prereq: FG202.*

FG411 Development of German Civilization (3-0-3). Contemporary German society, institutions and national policies. *Prereq: FG310 or approval of department chair.*

FG412 Modern Germany (3-0-3). Reviews main currents of postwar German political history, culture and society. *Prereq: FG310, FG320 or approval of department chair.*

FG421 & FG422 Representative Readings in German Literature I & II (3-0-3 & 3-0-3). Analysis and discussion of works of leading writers of various periods. *Prereq: FG320 or approval of department chair.*

Japanese Courses

FJ101 & FJ102 Basic Japanese I & II (3-0-3 & 3-0-3). Emphasizes the spoken language. Introduces kana script. *FJ101 Prereq: None & FJ102 Prereq: FJ101.*

FJ201 & FJ202 Intermediate Japanese I & II (3-0-3 & 3-0-3). Continues development of oral skills. Introduces reading and writing with kanji characters. *FJ201 Prereq: FJ102; FJ202 Prereq: FJ201.*

FJ301 & FJ302 Advanced Japanese I & II (3-0-3 & 3-0-3). Further development of listening, reading and speaking skills. Introduction to Japan and Japanese culture. *Prereq: FJ202.*

Russian Courses

FR101 & FR102 Basic Russian I & II (3-0-3 & 3-0-3). Emphasizes the spoken language. *FR101 Prereq: None & FR102 Prereq: FR101.*

FR201 & FR202 Intermediate Russian I & II (3-0-3 & 3-0-3). Continues development of oral, reading and writing skills with the emphasis on spoken Russian. Includes area and cultural topics. *FR201 Prereq: FR102 & FR202 Prereq: FR201.*

FR330 & FR340 Advanced Russian with Civilization Readings I & II (3-0-3 & 3-0-3). Further development of communicative skills in Russian. Emphasizes listening, speaking and reading. Knowledge of main socio-cultural periods from 9th through 20th centuries. *Prereq: FR202.*

FR411 Development of Russian Civilization (3-0-3). From the 10th century to World War II. *Prereq: FR340 or approval of department chair.*

FR412 Modern Russia (3-0-3). The Soviet Union since World War II; social, cultural, economic patterns; technology, armed forces; national policies. *Prereq: FR340 or approval of department chair.*

Spanish Courses

FS101 & FS102 Basic Spanish I & II (3-0-3 & 3-0-3). Uses a communicative approach with authentic interactive video and readings. *FS101 Prereq: None & FS102 Prereq: FS101.*

FS201 & FS202 Intermediate Spanish I & II (3-0-3 & 3-0-3). Stresses listening and speaking, with continuing development of reading and writing skills. Strong interactive video component. Includes area and cultural topics. *FS201 Prereq: FS102 & FS202 Prereq: FS201.*

FS301 Advanced Spanish with Civilization Readings (3-0-3). Develops fluency in conversation and facility in reading and writing. Listening comprehension skills are developed by an interactive video program. Topics emphasize main aspects of Hispanic civilization. *Prereq: FS202.*

FS304 Advanced Conversational Spanish (3-0-3). Develops proficiency in speaking and writing on topics based on literary selections, articles and recorded material on life in Hispanic countries. Program includes naval dialogues and terminology. *Prereq: FS202.*

FS412 Contemporary Latin American Civilization (3-0-3). Past and current social, economic, cultural and political patterns and problems. *Prereq: FS304 or approval of department chair.*

FS413 Spanish Civilization (3-0-3). Culture and civilization of Spain from the Roman period through the 20th century supplemented by videos, readings and classroom discussion. *Prereq: FS304 or approval of department chair.*

FS421 Spanish Literature (3-0-3). Representative works such as *The Cid* and *Don Quixote* reflecting the culture, ethics and values of Spain in its major literary periods. *Prereq: FS304 or approval of department chair.*

FS422 Spanish American Literature (3-0-3). Novels, stories, essays, poetry and plays reflecting the culture, ethics and values of major Spanish American countries from modernism to the present. *Prereq: FS304 or approval of department chair.*

FX101 & FX102 English for Non-Native Speakers I & II (3-0-3 & 3-0-3). Alternative to common plebe year courses HE111 & HE112. Emphasizes writing, American culture and values. *Prereq: approval of department chair.*





Department of Political Science

Political Science Major

The political science major is designed to provide prospective naval officers with an understanding of the structure and functions of domestic and international political systems and within a framework of political analysis. The wide-ranging, interdisciplinary program develops political science skills sequentially by first requiring foundation courses in international relations and United States government, emphasizing familiarity with the Constitution each midshipman has sworn to defend.

Upper-level courses offer the opportunity to explore law, political theory, institutional and policy analysis and area studies of the United States, Europe, the former Soviet Union, Latin America and Asia. The major is enhanced with courses in foreign languages. Summer internship programs in Washington and overseas and the possibility of graduate work in intelligence or national security affairs expand educational opportunities.

Each spring the political science department and the Division of Humanities and Social Sciences sponsor the Naval Academy Foreign Affairs Conference (NAFAC), which is run by midshipmen. NAFAC has become one of the foremost undergraduate conferences in the country, drawing professors and students from more than 140 colleges and universities in the U.S. and abroad, in addition to senior diplomats, military leaders and journalists. In addition to NAFAC, an active Model United Nations Club conducts a high school conference and participates in several college-level conferences around the country.

A bachelor of science degree is awarded. An honors program with a designated honors degree is available for selected students.

Curriculum Requirements (In addition to the requirements of plebe year)

Professional: NE203, NL302, NL400, NN204, NS310, NS40X;

Mathematics: SM223; plus either SM230 or SM212;

Science: SP211, SP212;

Humanities: HH205, HH206 and two electives outside the major including one at the 300/400 level;

Language: Four semesters of a foreign language;

Engineering: EN200, EN300; plus either EE300, ES310, ES420, or ES300, ES410, EE311, EE312;

Major: FP210, FP220, FP430, and seven major electives.

Political Science Courses

FP130 United States Government and Constitutional Development (3-0-3).

Basic concepts of American democracy, the Constitution, political process, structure and functions of national government and factors influencing its operation; emphasis on legal and ethical demands placed on government officials, both civilian and military, as defined by the Constitution and statute.

FP130X United States Government and Constitutional Development for Foreign Students (3-0-3). The basic concepts of American democracy and the Constitution placed in a comparative context for mid-shipmen from foreign countries.

Note: Successful completion of FP130 (or FP130X) is required for enrollment in all other required and elective courses in Political Science.

FP210 Introduction to International Relations (3-0-3). Approaches to analysis of international relations; nature and evolution of international political systems; foreign policy decision making; roles of non-state actors; diplomacy and war; Third World economic development; and international institutions. *Prereq: FP130.*

FP220 Political Science Methods (3-0-3). A discussion of the philosophy of science for the political scientist; instruction in research methods with emphasis on scientific method and quantitative techniques. *Prereq: FP130.*

FP310 Introduction to Global Strategic Studies (3-0-3). The course will examine the global international system from the strategic perspective to enhance our understanding of the processes and dynamics of global changes and their impact on professional careers in the naval service. *Prereq: FP130.*

FP311 Ethics and International Relations (3-0-3). At the outset, the focus will be on a study of the dominant theories of international relations, particularly Bismarkian realism and Wilsonian idealism. Then, using historical and fictional cases, passages from literature, and guest speakers, this course will explore case studies that illustrate the ethical dilemmas that arise in the relations between states. By

contrast with courses that treat ethical issues for an individual, this course deals with the acts of states and of other groups such as insurgency movements, non-governmental organizations, and international affiliations. *Prereq: FP130*

FP313 Information Technology, National Security and International Relations (3-0-3). Effects of information technology on both the national and international political systems; emphasis on changed weaponry, the vulnerability of "cyberspace" and other aspects of the information revolution on the relations among nations. *Prereq: FP210.*

FP314 Formulation of U.S. Foreign Policy (3-0-3). Case study-based review of the content, formulation and execution of U.S. foreign policies since World War II, including decision-making processes, administration of policy and development of current policies. *Prereq: FP130.*

FP322 Comparative European Politics (3-0-3). Study of foreign and domestic policy issues and processes of major European political systems as well as NATO, the European Union, and the U.S.-European relationship. *Prereq: FP130.*

FP323 Comparative Latin American Politics (3-0-3). Social, economic and political environments; regimes and government institutions and interest groups, political parties, students, church and armed forces; theories of Latin American political behavior with country case studies. *Prereq: FP130.*

FP324 Latin American International Politics (3-0-3). Latin American international subsystem; foreign policy making of Latin American states, United States, Europe, Japan and others; roles of non-state actors; international institutions; diplomacy and violence; and application of international theory. *Prereq: FP130.*

FP325 American Political Philosophy (3-0-3). The theories and practices of Jefferson, Madison, Lincoln, Calhoun, Martin Luther King and other seminal American political thinkers; special emphasis on societal progress and public policy ambiguity under the banner of Liberty and Equality. *Prereq: FP130.*

FP326 American Presidency (3-0-3). Growth and evolution of Office of the President; executive agencies, their function, control and problems; special attention to

president's role as commander in chief and relations with the legislative and judicial branches. *Prereq: FP130*

FP328 Legislative Process (3-0-3). Decision making in the U.S. Congress; committee and elections, role of party and committee, and interaction with executive and judicial branches, bureaucracy, interest groups and other actors. *Prereq: FP130*

FP335 Non-Democratic Politics (3-0-3). Examination of modern totalitarian and authoritarian regimes as distinct forms of political organization. *Prereq: FP130*

FP340 Modern Political Thought and Ideology (3-0-3). Introduces students to the main components of contemporary political ideas and principles. The course distinguishes among philosophical arguments, ideological convictions, and social movements. It emphasizes that during the twentieth century this distinction has blurred, resulting in highly popularized ideology disguised as philosophy. During this course, important concerns about basic political values, the nature of justice and the distribution of wealth along with central concepts like equality, liberty, and rights are considered in light of topical issues. Though a logical sequel to the required FP430 (Political Philosophy) course, this course is open to any student interested in exploring contemporary political arguments and proposals. Readings range from the extremes of anarchism to debates about feminism and environmentalism. *Prereq: FP130.*

FP341 Political Psychology (3-0-3). Introduction to psychological concepts and approaches used to analyze politics. Topics covered include acquisition of personal political attitudes and beliefs; the dynamics of public opinion; theories underlying PsyOp (Psychological Operations), riots, revolutions and wars; and psychological sources of effective and defective decisions in small group settings such as juries, military commands and policy settings. *Prereq: FP130.*

FP345 Environmental Politics and Security (3-0-3). This course examines the major environmental problems currently influencing U.S. domestic and environmental security policies. It explores major theories about the relationships among environmental, demographic, and political conflicts and provides a broad overview of what is known and still

unknown. Public policy controversies related to global warming, pollution, degradation and future scarcity of land, air, ocean, fresh water resources and biodiversity are examined in some detail. Enduring and novel ethical issues about how to promote the rights of humans and other species are covered in discussions and debates. Special emphasis is placed on DoD environmental programs and the legal responsibilities and obligations of naval officers in implementing U.S. environmental security policies. Each midshipman will choose a specific environmental security issue and learn to complete a policy evaluation. *Prereq: FP130.*

FP350 Political Economy (3-0-3). This course provides an understanding of the collective action taken by the state and the economy where individuals engage in self-interested behavior. It deals with how the state uses power to make decisions about who gets what, when and how; and how scarce resources are allocated and distributed through the market process. Topics include: the structure of political economy, state-market tensions, economic nationalism, democracy and capitalism, and international trade and finance. *Prereq: FP210.*

FP355 Civil-Military Relations (3-0-3). An examination of the interplay between civilians and the military in a liberal democratic society. The course blends of theory, practice, policy, sociology, history and political philosophy to examine the relationship of the professional military to the society which it serves. Employs a comparative approach with emphasis on case studies. *Prereq: FP130.*

FP356 Conflict and Peacemaking (3-0-3). This seminar course will focus on examining, discussing, and learning how to think critically about the nature of conflicts and the art of peacemaking in the post-Cold War world. It will include lectures, problem-centered learning approaches and discussion sessions. Interactions with experts and a visit to a foreign embassy will assist midshipmen in gaining a perspective on conflict management and peacemaking. *Prereq: FP130.*

FP357 Politics of China and Japan (3-0-3). An examination of the Chinese/Japanese political system with emphasis on the dynamic interaction of traditional and Western forces. *Prereq: FP130.*

FP365 African Politics (3-0-3). Analysis of political trends and constitutional development of African political systems; their relations with one another and outside world; attention directed to U.S. security interests in Africa. *Prereq: FP130.*

FP367 Politics of Russia and the CIS (Commonwealth of Independent States) (3-0-3). The development and disintegration of the modern Soviet political system. *Prereq: FP130 (FP210 highly recommended).*

FP368 Comparative Asian Politics (3-0-3). Systematic comparative approach to the study of political systems in East and Southeast Asia (with country cases selected from the Koreas, Taiwan, Malaysia, Myanmar, Indonesia, Philippines, Singapore, Thailand and Vietnam); theoretical emphasis on ethnic conflict, economic development and democratization. *Prereq: FP130.*

FP369 Middle Eastern Politics (3-0-3). Comparative analysis of domestic politics, political economy, the role of religion, foreign policies, and elements of international relations of Middle Eastern political systems; theoretical emphasis on ethnic conflict, conflict resolution and democratic development. *Prereq: FP130.*

FP370 International Russian and Euro-Asian Politics (3-0-3). Discussion of geopolitical, ideological, institutional, cultural and economic factors affecting foreign policy decision making in Russian and other members of Commonwealth of Independent States; regional and global issues of security, democracy and free market economics. *Prereq: FP130 (FP210 highly recommended).*

FP371 Asian International Politics (3-0-3). Analysis of interstate relations of selected East and Southeast Asian states; concentration on regional organizations, security alliances and bilateral arrangements. *Prereq: FP130.*

FP372 Political Parties, Campaigns and Interest Groups (3-0-3). Study of dynamics of group politics in the U.S. political system; emphasizes roles played by parties, interest groups, public opinion and elections in the U.S. political process. *Prereq: FP130.*

FP375 Politics and the Media (3-0-3) A comprehensive analysis of how print, electronic and computer-based mass media choose, cover and disseminate information about American politics and government. Analysis of contemporary media from the perspective of subjects, disseminators and consumers of the news. *Prereq: FP130.*

FP384 Politics of Low Intensity Conflict (3-0-3). Theoretical, historical and policy examination of low-level political-military confrontation; viewed from several perspectives, such as revolutionary, policy-making, military and nation-state; focus on U.S. response to LIC. *Prereq: FP130, 2/C.*

FP397 Criminal Law and Justice (3-0-3). An examination of both (1) the criminal justice system and the requirements of due process as mandated by the Constitution (double jeopardy, coerced confessions, plea bargaining, etc.) and (2) the criminal law—the nature of criminal intent, the criminal act, the defenses (self-defense, insanity, etc.) as illustrated in such common law felonies as murder, rape, robbery, and battery. *Prereq: FP130, 2/C.*

FP403 Advanced Research Seminar in Washington (3-0-3). Intensive hands-on introduction to unique research resources of Washington, D.C., such as Library of Congress computer system, Federal Elections Commission Data Base and others; research design, field trips to Washington for data base use and elite interviewing. *Prereq: 1/C FPS major.*

FP407 Intelligence and National Security (3-0-3). Examination of nature, significance and development of intelligence including collection, counterintelligence, clandestine and covert action and evaluation; includes current issues and case studies. *Prereq: FP130, FP210, 2/C, U.S. citizenship.*

FP408 International Law (3-0-3). Survey of public law of nations including jurisdiction, citizenship, nationality, human rights, and treaty law. This course places special emphasis on the law of the sea, the law of war, and the legal issues involving the use of force by states. *Prereq: FP210.*

FP413 Constitutional Law: Federal System (3-0-3). An analysis of key Supreme Court decisions interpreting the power of the judiciary, the executive and congress under the Constitution; nation-state relations; the commerce power; economic liberties. *Prereq: FP130.*

FP414 Constitutional Law: Civil Rights and Civil Liberties (3-0-3). An analysis of leading Supreme Court decisions in the areas of speech, press, and religion; equal protection of minorities and women; privacy. *Prereq: FP130.*

FP420 Public Policy Analysis (3-0-3). Analysis of U.S. public policy toward social and economic problems, including nature of social choice; survey of selected policy areas, such as health care, education, housing and economic and social welfare. *Prereq: FP130.*

FP421 National Security Policy (3-0-3). Examination of interaction of domestic and foreign political and military considerations in the formulation and execution of national security policy; use of case studies and review of current strategic policies. *Prereq: FP130.*

FP430 Political Philosophy (3-0-3). Study of Western political philosophy, with emphasis on roots of democracy and the meaning of justice; explores relationship between individual and society, as well as the sources of a state's power and authority; examines works of major thinkers from Plato to the present. *Prereq: FP130.*

FP437 International Organizations (3-0-3). International organizations in world politics; attention given to control of conflict and violence, economic cooperation and management of global resources; major focus on the United Nations; discussion of selected regional issues and other organizations. *Prereq: FP130 and FP210.*

FP440 Politics of Central Europe (3-0-3). Analysis of the politics of Central Europe from a comparative perspective; the transition for national identity and economic development in the post-communist environment. *Prereq: FP130.*

FP510 Honors Senior Thesis (3-2-0). The principal objective of this course is to write a thesis based on an independent research project using a variety of data collection and analysis methods. The final paper will be presented orally and evaluated by a team of faculty members. *Prereq: FP530, FP540, I/C FPS11.*

FP530 Honors Advanced Research Design (2-0-2). Advanced research techniques; individual design guidance with special reference to advanced statistical techniques and unique research resources of the Washington, D.C., area. *Prereq: 2/C FPS11.*

FP540 Honors Senior Seminar (3-0-3). An advanced research seminar to carry out the research that will culminate in a senior honors thesis. *Prereq: FP530, I/C FPS11.*



Division of Mathematics and Science

Department of Chemistry

Department of Computer Science

Department of Mathematics

Department of Oceanography

Department of Physics





Department of Chemistry

Chemistry Major

The chemistry major at the Naval Academy provides midshipmen with training in all of the discipline's traditional fields, leading to a bachelor of science degree certified by the American Chemical Society.

All chemistry majors take required courses in organic, inorganic, analytical and physical chemistry. In addition to the required courses, midshipmen may take advanced courses in each of these subject areas along with other subject areas such as biochemistry, polymer chemistry, and environmental chemistry. Individual laboratory research projects enable midshipmen to investigate topics of particular interest to them under the guidance of a faculty member.

Chemistry is an experimental science, and many hours are devoted to laboratory work. The chemistry department at the Naval Academy has one of the finest undergraduate laboratories in the nation, with modern spaces and a wide array of instrumentation. Skilled technicians maintain the laboratories, assist the faculty and help midshipmen solve practical problems in the labs. Faculty have a wealth of experience, not only in their academic understanding of chemistry but also in the practical application of chemistry in the Navy and Marine Corps. Chemistry majors will find that their civilian and military instructors can make the study of chemistry a highlight of their learning experience at the Naval Academy.

The chemistry major gives midshipmen a solid background in scientific principles required for most of the technical disciplines in which they will work as naval officers. It also provides an excellent academic base for graduate studies in such diverse fields as medicine, oceanography, operations research, management and engineering.

Curriculum Requirements (In addition to the requirements of plebe year)

Professional: NE203, NL302, NL400, NN204, NS310, NS40X;

Mathematics: SM223, SM212;

Science: SP211, SP212;

Humanities: HH205, HH206 and two electives including one at the 300/400 level;

Engineering: EE311, EE312, EN200, EM300, ES300, ES410;

Major: SC201, SC202, SC310, SC321, SC301, SC306, SC403, SC407, SC408, SC410 and two major electives; one free elective.

Division of Mathematics & Science Courses

SY100 Fundamentals of Science (3-3-4).

A one semester course designed to review fundamental linguistic and mathematical problem solving techniques in the physical sciences. *Prereq: selection by Academy committee.*

Chemistry and Biology Courses

BIOLOGY COURSES

SB251 General Biology I (3-2-4). Fundamental principles of the science of biology are introduced. Topics include metabolism, cell structure and function, classical and molecular genetics, evolution and ecology. The perspective of the course is from life as a whole, with a focus on the position of humans in the overall scheme.

SB252 General Biology II (3-2-4). Physiology is the principal focus of the course. The structure and function of organ systems and their interactions is covered in lecture; laboratory emphasis is on histology, the microscopic study of cells, tissues and organs. Development, especially embryology, is also studied. Although the theme is the comparative study of various taxonomic groups, the concentration is on human biology. *SB251 is recommended, but not a prerequisite.*

CHEMISTRY COURSES

SC111 & SC112 Foundations of Chemistry (3-2-4 & 3-2-4). A two-semester sequence presenting the fundamental laws and theories of chemistry. Major topics include chemical stoichiometry, periodic trends, atomic structure, chemical equilibrium, thermodynamics, nuclear chemistry, electrochemistry and kinetics. The material is presented in a lecture format complemented with experiments designed to develop the student's laboratory skills. Naval applications of chemistry are introduced throughout the courses to provide an awareness of chemistry in normal Navy operations. *SC111 Prereq: None & SC112 Prereq: SC111.*

SC121 & SC122 Investigations in Chemistry (3-2-4 & 3-2-4). The course structure is similar to that of SC111-112, but the laboratory portion of the course involves some investigative experiments, which are similar to research projects. This sequence is designed for the student with some previous background in chemistry and a strong interest in the subject. *Prereq: permission of department chair.*
SC121 Prereq: None & SC122 Prereq: SC111 or SC121.

SC151 Modern Chemistry (3-2-4).

A one-semester course for the well-prepared student, satisfying the plebe year chemistry requirement. Students entering this course must have demonstrated their understanding of fundamental chemical concepts by a strong performance on the chemistry validation exam. *Prereq: permission of department chair.*

SC201 & SC202 Organic Chemistry I & II (3-6-5 & 3-6-5). The chemistry of covalent compounds of carbon, including aromatic, aliphatic and heterocyclic. The second semester laboratory includes qualitative organic analysis. Special attention is given to areas of petroleum, plastics, drugs and spectroscopy. *Prereq: SC151 or SC122 or SC112.*

SC303 Physical Chemistry I (3-0-3).

An introduction to the physical properties of matter, with emphasis on the thermodynamic aspects of physical chemical processes. *Prereq: SM223, (or SM221), SP212.*

SC304 Physical Chemistry II (3-0-3). An introduction to the physical properties of matter, with emphasis on the quantum theory of atomic and molecular structure, including spectroscopy. *Prereq: SM223, SP212.*

SC306 Instrumental Methods of Analysis (3-6-5). The theory and applications of modern instrumental methods of analysis are stressed. A wide array of sophisticated instruments is available for student use. *Prereq: SC321, SC301.*

SC310 Inorganic Chemistry (3-0-3). The chemistry of the Main Group elements is used to establish the conceptual framework of inorganic chemistry. *Prereq: SC202, SC321.*

SC316 Physical Chemistry Laboratory I (0-3-1). Laboratory emphasizes experiments in thermodynamics using both classical methods and modern instrumentation. *Prereq: SC321, SC303.*

SC321 Quantitative Analysis (2-6-4).

A study of volumetric, gravimetric and modern optical and electrochemical methods of analysis. Theory and laboratory procedures and techniques are stressed. *Prereq: SC151, SC122 or SC112.*

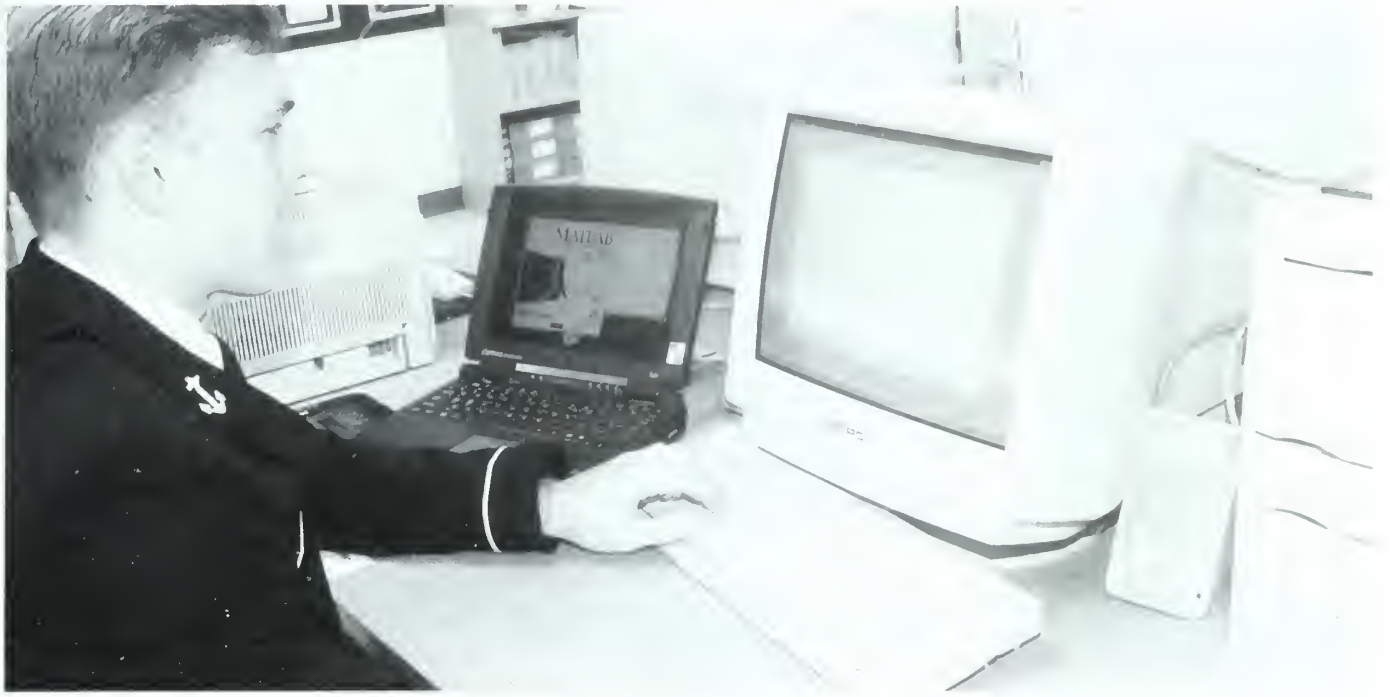
SC410 Inorganic Chemistry II (3-3-4). Uses concepts of SC310 and expands to consider the chemistry of the transition metals. Laboratory emphasizes modern techniques of synthesis, purification and identification. *Prereq: SC304, SC310.*

SC417 Physical Chemistry Laboratory II (0-3-1).

Laboratory emphasizes experiments in spectroscopy and kinetics, utilizing modern instrumentation. *Prereq: SC304*

SC432 Biochemistry (3-0-3). The chemistry of biological processes is discussed, emphasizing the structure and function of genes and proteins and biochemical pathways by which cells use energy. *Prereq: SC201.*





Department of Computer Science

Computer Science Major

The computer science major gives students a strong foundation in the main areas of computer science with a focus on naval applications.

The Computer Science program at the Naval Academy is accredited by the Computer Science Accreditation Commission (CSAC) of the Computer Sciences Accreditation Board (CSAB). During their four years at the Academy, computer science majors will complete 46 semester hours of courses in the major which includes 3 hours of probability and statistics. Upon graduation, they will be awarded a bachelor of science in computer science.

The Computer Science Department has four large computing laboratories. Two of these labs contain high-end desktop personal computers which are used exclusively for instructional support and are networked for local and remote access. The Graphics and Software Engineering Lab contains SUN workstations. They provide the student with experience using the UNIX operating system and workstation levels graphics and software tools. The Robotics Lab contains manipulator arms, vision systems, desktop computers and mobile robots. These are used for a variety of hands-on projects.

Today's Navy and Marine Corps require junior officers with the highest levels of technical expertise and professional competence. The computer science major will be well equipped to meet the challenges created by rapidly evolving computer technologies.

Curriculum Requirements (In addition to the requirements of plebe year)

Professional: NE203, NL302, NL400, NN204, NS310, NS40X;

Mathematics: SM223, SM239

Science: SP211, SP212;

Humanities: HH205, HH206 and two electives including one at the 300/400 level;

Engineering: EN200, EM300, plus either EE300, ES310, ES420, and a free elective, or ES300, ES410, EE311, EE312, SM212;

Major: SI204, SI221, SI262, SI304, SI311, SI332, SI411, SI433, SI434, SI472, and four major electives.

Computer Science Courses

SI202 Problem Solving and Computing (3-2-4). This course presents the fundamentals of personal computers including their use in a structured and organized approach to problem solving using a high level programming language. Additional topics include security, privacy, and ethical issues relevant to information systems. *Prereq: none.*

SI204 Introduction to Computer Science (3-2-4). Introduction to algorithmic development, problem solving and software design. Principles and concepts to provide foundation, knowledge and experience upon which later computer science courses will build. The first course for computer science majors. *Prereq: none.*

SI221 Data Structures (2-2-3). Data representation and information management. Lists, strings, arrays, and trees. Storage structures, allocation and collection. Sorting techniques, hashing and searching. *Prereq: SI204.*

SI250 Information Systems for the Junior Officer (2-2-3). The primary emphasis of the course is practical applications of personal computers in the fleet/Fleet Marine Force (FMF), with coverage of some special tactical computers as well. Application software is addressed from a junior officer's viewpoint, as an operational unit Branch/Division/Company Officer or as a support staff member. *Prereq: none.*

SI262 Discrete Structures (3-0-3). An introduction to the mathematical foundations of computing through graph theory, set theory, propositional logic, and numerical linear algebra. *Coreq: SI204.*

SI283 Programming for Engineers (1-2-2). An introduction to a structured programming language and its use in implementing algorithms to solve engineering problems. *Prereq: none.*

SI304 Programming Languages (3-0-3). A study of formal language specification. Topics include data typing, program structure, sequencing, recursion, storage

management, file interfacing and translation and syntax. The implementation of features like run time stacks, environmental tables and parameter transmission are discussed in detail. *Prereq: SI221, SI262.*

SI305 Computer Programming (3-0-3). Use of top-down design and software engineering methodology to develop algorithms for problem solving. A high-level language is used to implement the algorithmic designs. *(For non-majors.)*

SI311 Advanced Programming (3-0-3). Machine and assembly language, compilers and interpreters. Program segmentation and linking. Macros, sub-routines and utility routines. Input/output, peripheral devices and auxiliary storage. Program efficiency and documentation. *Prereq: SI221, SI262.*

SI332 Introduction to Computer Architecture (3-0-3). Organization, logic design and components of digital computing systems. Overall organization of modules into a system. *Prereq: SI204, SI262.*

SI411 Operating Systems (3-0-3). The study of the operating system as a resource manager. Topics include process management, interrupt processing, memory management, deadlock handling, file systems, multiprogramming, multiprocessing, data security and protection. *Prereq: SI221, SI332.*

SI412 Compiler Construction (3-0-3). Using formal programming language theory as a foundation, the issues of automated theory, program optimization and language translation are examined. Sections of actual compilers are constructed to study the practical application of theory presented. *Prereq: SI311, SI472.*

SI420 Artificial Intelligence (3-0-3). A study of the fundamental concepts and techniques in the design and implementation of functionally intelligent machines. Topics include problem-solving using state-space search, problem-reduction techniques, game trees, general problem solver; and knowledge representation using production systems, first-order predicate calculus and natural language. *Coreq: SI304.*

SI430 Fundamentals of Microcomputer Systems (2-2-3). Analysis and design of software systems for micro-processors. Includes characteristics and organization of microprocessors, peripheral interface software and applications of software design. *Prereq: SI221, SI311.*

SI433 Advanced Computer Algorithms (3-0-3). Presents techniques for designing and analyzing various computer algorithms including such topics as searching and sorting methods, graph algorithms, file compression, cryptology, dynamic programming and parallel algorithms. *Prereq: SI304*

SI434 Software Engineering (3-0-3). An introduction to the basic principles of software engineering. Structured, object-oriented, and formal approaches are studied, with an emphasis on object-oriented techniques. *Prereq: SI304.*

SI435 Advanced Software Engineering (2-2-3). This course will present the latest trends in modern techniques and methods for large-scale software development activities, such as object oriented programming. The use of CASE tools and group design project is stressed. *Prereq: SI434.*

SI440 Database Organization (3-0-3). Topics include database systems architecture, the various approaches to database organization including relational, hierarchical and network models; normalization and implementation issues. *Coreq: SI304.*

SI452 Advanced Computer Architecture (3-0-3). This course provides an advanced study of the design and evaluation of high performance computer systems. *Prereq: SI311, SI332.*

SI454 Computer Networks (3-0-3). The course presents major topics in the area of computer networks. It views a computer network as a group of related layers or abstract machines as exemplified by the International Standards Organization (ISO) network reference model. *Prereq: SI332.*

SI455 Advanced Computer Networks (3-0-3). This course provides an in-depth technical study of high-speed networking, client-server programming and applications, network firewall architectures and security procedures, and the ATM network. *Prereq: SI454.*

SI460 Computer Graphics (2-2-3). Presents the concepts, theories and algorithms related to computer graphics. Builds understanding in evaluating and implementing graphical support in various application settings. *Prereq: SI221, SI262.*

SI462 Advanced Computer Graphics (2-2-3). Presents the theories and techniques of producing 3-dimensional computer graphics, and the capabilities and limitations of existing graphics standards. *Prereq: SI460.*

SI472 Theory of Computing (3-0-3). Presents the theoretical foundations for computing, including the study of finite state machines, pushdown automata, and Turing machines. *Prereq: SI304.*

SI475 Robotics and Computer Vision (2-2-3). Presents the concepts and theories related to computer driven robotic systems and computer based vision systems. Students apply acquired knowledge in a laboratory setting by designing, coding, and testing robotics control and vision systems. *Coreq: SI304.*





Department of Mathematics

Mathematics Major

The major in mathematics gives students the opportunity to acquire a sound mathematical foundation and to develop facility in applying mathematical concepts and techniques. The program permits concentration in mathematics, operations analysis, or scientific computing. A bachelor of science degree in mathematics is awarded. An honors program with a designated honors degree is available for selected students.

A solid background in mathematics facilitates postgraduate specialization in many technical areas, including nuclear power. Mathematics provides the broad foundation for the development of analytical skills required to work with and develop new technology.

The mathematics department is the largest academic department at the Naval Academy. Each semester about two-thirds of all midshipmen take one or more courses in mathematics. Courses are taught in sections with 20-22 students in lower level courses and 15-18 students in upper level courses. Because of the department's size, there is a wide variety of elective courses to satisfy individual interests or major requirements.

Curriculum Requirements (In addition to the requirements of plebe year)

Professional: NE203, NL302, NL400, NN204, NS310, NS40X;

Science: SP211, SP212;

Humanities: HH205, HH206 and two electives including one at the 300/400 level;

Engineering: EE311, EE312, EN200, EM300, ES300, ES410;

Mathematics: SM221 or SM251, SM222;

Major: SM261, SM239, SM291, SM331, SM332, SM339, SM342 or SM362, SM365, plus four major electives including at least one at the 400 level; one free elective.

General Science Major

The major in general science gives students the opportunity to pursue a broad, scientifically-oriented program in the field of physical applications of mathematics and science. The major permits midshipmen to experience an interdisciplinary technical course without the need for specialization. A bachelor of science degree is awarded.

Curriculum Requirements (In addition to the requirements of plebe year)

Professional: NE203, NL302, NL400, NN204, NS310, NS40X;

Mathematics: SM221 or SM223, SM230;

Science: SP211, SP212;

Humanities: HH205, HH206 and two electives including one at the 300/400 level;

Engineering: EN200, EM300; plus either EE300, ES310, ES420, and a free elective, or ES300, ES410, EE311, EE312;

Major: NP340, SA302, SI202, SB251, SM212, SO231, SO344, SP301, SP411, a free elective, and two math/science/engineering electives.



Mathematics and Operations Analysis Courses

Mathematics Courses

SM005 Pre-Calculus Mathematics (4-1-4). Basic review of algebraic and arithmetic operations, analysis of functions and their graphs, and trigonometry. This course may be required in addition to stated graduation requirements for certain midshipmen. *Prereq: permission of department chair.*

SM121 & SM122 Calculus I & II (4-0-4, 4-0-4). Differential and integral calculus of one real variable; infinite series. SM121 *Prereq: None & SM122* *Prereq: SM121 or SM131.*

SM131 Calculus I (3-0-3). Same as SM121 for students with prior differential calculus experience.

SM161 & SM162 Calculus with Computers I & II (5-0-5, 5-0-5). Programming using MATLAB and a computer algebra package, algorithmic development of the integral and differential calculus of one real variable. SM161 *Prereq: permission of department chair & SM162* *Prereq: SM161.*

SM212 Differential Equations (4-0-4). Linear and simultaneous differential equations; solution by Laplace transform; partial differential equations and Fourier series. *Prereq: SM221, SM223, or SM251.*

SM219 Statistics and Probability (3-0-3). Nature of statistical methods, description of data, probability, distributions, estimation, tests of hypothesis, correlation, regression. Credit cannot be given for SM219 if credit has been given for SM230 or SM239. *Prereq: SM122 or SM162.*

SM221 Calculus III with Vector Fields (4-0-4). Differential and integral calculus of several real variables; vector analysis including integral theorems. *Prereq: SM122 or SM162.*

SM222 Differential Equations with Matrices (4-0-4). A more rigorous treatment of material from SM212, the course uses basic ideas from linear algebra.

Intended for mathematics majors. *Prereq: SM221, SM223, or SM251; coreq: SM261.*

SM223 Calculus III with Optimization (4-0-4). Differential and integral calculus of several real variables; vector analysis; optimization techniques for functions of several variables. *Prereq: SM122 or SM162.*

SM230 Probability with Naval Applications (3-0-3). An elementary treatment of the basic concepts of probability with an emphasis on naval applications. Sample spaces, discrete and continuous random variables and standard distributions. Selected topics of naval applications of probability theory such as random search, minefields and lateral range curves. Conditional probability and Bayes' theorem. *Prereq: SM122 or SM162.*

SM239 Probability and Statistics I (3-0-3). A more rigorous treatment of material in SM230 for advanced work in mathematics, operations research, science and engineering. Credit cannot be given for both SM230 and SM239. *Prereq: SM221, SM223, or SM251.*

SM251 Calculus with Computers III (4-0-4). Course content includes and extends that of SM221 with extensive computer applications. *Prereq: SM162.*

SM259 Mathematical Logic (3-0-3). Mathematical languages, formal logic, propositional calculus and truth tables, first order predicate calculus, proof theory, axiomatic systems and model theory. Applications to logical networks and nonstandard analysis. *Prereq: SM122 or SM162.*

SM261 Matrix Theory (3-0-3). Matrices, transformations, linear equations, vector spaces, characteristic matrix, eigenvalues, orthogonality. *Prereq: SM122 or SM162.*

SM271 Linear Programming (3-0-3). Simplex and dual simplex methods, minimax theorem, transportation problems and game theory. *Prereq: SM122 or SM162.*

SM279 Multivariable Calculus (3-0-3). An introduction to the geometry and analysis of n-dimensional space, including topics on multidimensional curves, inner products, linear functions, real valued functions, Taylor approximations, optimization, inverse function theorem, implicit function theorem, and change of variables in integration. Applications to economics and physics will be discussed. *Prereq: SM221 or SM223, SM261.*

SM291 Fundamentals of Mathematics I (2-2-3). Introduction to mathematical reasoning and the written and oral presentation of mathematical concepts, theory, and application of sets and relations. *Prereq: SM122 or SM162.*

SM311 Engineering Mathematics I (3-0-3). Vector analysis, Fourier analysis, partial differential equations, Sturm-Liouville problems, Legendre polynomials, determinants, and matrices. *Prereq: SM212 or SM222.*

SM311O Engineering Mathematics I (3-0-3). Vector analysis, Fourier analysis, partial differential equations with emphasis on stream and potential functions, conservation of mass, conservation of linear momentum (Navier-Stokes Equations) in rectangular and rotating coordinate systems. *Prereq: SM212 or SM222.*

SM311P Mathematical Models for Physics (3-0-3). A course in mathematics applicable to physics. Includes topics from the following areas: linear (vector) algebra, linear (vector) analysis, boundary value problems and variational calculus. *Prereq: Calculus III and Differential Equations.*

SM312 Engineering Mathematics II (3-0-3). Laplace and Fourier transforms, selected topics from complex variables. *Prereq: SM212 or SM222.*

SM313 Engineering Mathematics III (3-0-3). Fundamental topics from calculus-based probability theory (discrete and continuous random variables, multivariate distributions, expected values, and the Central Limit Theorem) and from linear algebra and matrix theory (matrix operations, Gaussian elimination, linear independence, eigenvalues, and solutions to

systems of ordinary differential equations) suitable for applications in engineering. *Prereq: SM212 or SM222.*

SM314 Engineering Mathematics with Statistics (4-0-4). Basic concepts in probability and statistics, Laplace transforms, Fourier analysis, and complex variables with applications. *Prereq: SM212 or SM222.*

SM315 Introduction to Partial Differential Equations (3-0-3). Linear equations, Cauchy problems, Laplace and Poisson equations, boundary value problems, heat equations, Sturm-Liouville problems, and orthonormal expansions. *Prereq: SM212 or SM222.*

SM331 & SM332 Advanced Calculus I & II (4-0-4, 4-0-4). Logic, induction, sequences, limits, real numbers, series, continuity, differentiability, properties of continuous functions, the Riemann Integral, power series. *Prereq: SM261, SM291.*

SM331H & SM332H Real Analysis I & II (4-0-4, 4-0-4). Honors versions of SM331 and SM332. *Prereq: Permission of mathematics department honors committee.*

SM339 Applied Statistics I (3-0-3). An applied study of a variety of statistical methods used in obtaining, presenting, summarizing and analyzing statistical information. Included are strategies for data collection and presentation, and techniques of statistical inference for population, parameters based on the concepts of sampling, probability and distribution theory. *Prereq: SM239, SM261.*

SM342 Discrete Structures I (3-0-3). Foundations and methods of proof. Combinatorics, graph theory, group theory. Selected topics. *Prereq: SM122 or SM162.*

SM362 Modern Algebra (3-0-3). Integers, groups, mappings, rings, fields. *Prereq: SM261, SM291.*

SM365 Introduction to Scientific Computing (4-0-4). Computer arithmetic and errors, algorithms and programs for iterative solution of equations, linear systems, function approximations, numeric integration, ordinary differential equations, use of scientific software libraries and introduction to MATLAB. *Prereq: SM261 or SM311.*

SM411 Introduction to Complex Variables (3-0-3). Algebra and topology of complex numbers. Elementary functions. Complex derivative and integral. Theorems of Cauchy. Analytic functions, conformal mappings, Taylor and Laurent series, singularities, residue theory, analytic continuation. Applications to real analysis and physical problems. *Prereq: SM331.*

SM425 Advanced Numerical Analysis (3-0-3). Numerical solution of equations in one and several variables, direct and iterative algorithms, rate of convergence. Computer methods emphasized. *Prereq: SM212 or SM222, SM331 or permission of department chair.*

SM426 Numerical Methods for Differential Equations (3-0-3). Interpolation and polynomial approximation, numerical integration and differentiation, numerical algorithms for initial value and boundary value problems. *Prereq: SM212 or SM222, SM331 or permission of department chair.*

SM444 Discrete Structures II (3-0-3). Topics in combinatorics and graph theory, with applications. Latin squares, linear algebra and combinatorics, finite projective planes, topological graph theory, Ramsey theory, trees. *Prereq: SM342.*

SM461 Linear Algebra (3-0-3). Vector spaces, linear transformations, Jordan canonical form, inner product spaces. *Prereq: SM261, SM331.*

SM462 Algebraic Structures (3-0-3). Groups, rings, fields, Galois theory. *Prereq: SM362, SM331.*

SM464 Topology (3-0-3). A mathematical analysis of topological spaces, separation axioms, covering properties, and metric spaces. *Coreq: SM332.*

SM465 Advanced Differential Equations (3-0-3). Existence and uniqueness of solutions to ordinary differential equations. Stability, oscillation, dynamical systems. *Prereq: SM212 or SM222; coreq: SM332.*

Operations Analysis Courses

SA302 Analysis of Naval Tactics (3-2-4)
An introduction to the techniques of modeling and quantitative analysis applied to specific naval operational problems, including search and patrol, screening, anti-air warfare, mining, equipment reliability and decision rules. *Prereq: SM239 or SM230.*

SA367 Introduction to Mathematical Modeling (3-0-3). Realistic problems, often of military interest, are formulated mathematically and solved using techniques from probability, statistics, calculus and differential equations. The analysis is carried out by students working in small teams and individually. Solutions are presented in oral nontechnical briefings and in written technical reports. *Prereq: SM239 or SM230.*

SA401 Linear Models and Optimization (3-0-3). Investigation of fundamentals of linear optimization subject to constraints, including construction and analysis of linear programming and network problems. *Prereq: SM261.*

SA402 Dynamic and Stochastic Models (3-0-3). Investigation of quantitative analysis of decision options, including PERT/CPM, dynamic programming, Markov chains and queuing theory. Applications to typical operations are stressed. *Prereq: SM239 or SM230, SM261.*

SA410 Applications of Search and Detection Theory (3-0-3). Considerations in picking a measure of effectiveness (MOE) for use in analyzing decision options and decision criterion are studied. The focus of the course is the analysis of search and detection operations, particularly as they arise in anti-submarine operations, using probability models. Barrier detection, area search and parallel sweep operations models are developed. Additional topics in mine warfare, target coverage models, anti-air warfare, and target motion analysis may be picked for study by the instructor. Credit cannot be given for both SA302 and SA410. *Prereq: SM239 or SM230.*

SA412 Projects in Operations Analysis (2-2-3). Operations research techniques are applied using student projects, case studies and visiting lecturers. Topics include current military and industrial problems. *Prereq:* permission of department chair.

SA421 Simulation Modeling (3-0-3). Discrete simulation of systems using a simulation language. Includes random number generation, validation and verification of simulations, input and output data analysis. Semester projects are done as part of an analysis team. *Prereq:* SM339.

SA430 Logistics (3-0-3). Investigation of techniques of operations analysis applicable to the solution of problems in reliability, maintainability, availability and inventory. *Prereq:* SM239.

SA442 Applied Statistics II (3-0-3). A continuation of SM339 that includes examination, evaluation and application of advanced statistical methods. Techniques studied include sampling, nonparametric analysis, simple and multiple regression, correlation, analysis of variance and decision theory. *Prereq:* SM339.

SA475E Research Seminar in Quantitative Economics (3-0-3). Directed research on a specific topic. Capstone course for Quantitative Economics majors. Emphasis on empirical work using computers. *Prereq:* 1/C SQE major.





Department of Oceanography

Oceanography Major

The oceanography major gives future naval officers practical and theoretical knowledge of the ocean environment and builds a sound academic foundation for future graduate study in any technical discipline. An interdisciplinary science major, oceanography involves the study of meteorology, geophysics, physics, chemistry, biology and geology as they relate to the ocean environment. Basic courses in these areas are prerequisites for more advanced oceanography and meteorology courses. Students take courses in sound propagation in the ocean, the study of waves and tides, and the use of satellites in oceanography. A course in advanced biological oceanography offers a glimpse of the undersea world and its marine creatures; synoptic meteorology courses involve hands-on weather forecasting experience using the latest tools available. More than 25 percent of the required course load is within the oceanography specialty. Other courses include advanced mathematics, necessary to describe the complex behavior of fluid environments. A bachelor of science degree is awarded. An honors program with a designated honors degrees is available for selected students.

The Naval Academy boasts the most extensive undergraduate oceanographic facilities in the country. Located on a pier adjacent to the mouth of the Severn River, the Hendrix Oceanography Laboratory is a multi-function enclosure featuring a wet laboratory where students study the world's largest estuary, the Chesapeake Bay. Midshipmen have the opportunity to participate in a three-week oceanography cruise during the summer training period. The academy's oceanographic research vessel enables midshipmen to collect samples and oceanographic data afloat and deliver them to the department's shore labs. Another laboratory complex in Rickover Hall houses the geological, biological, chemical, general oceanographic and remote sensing laboratories. A separate meteorological laboratory has an on-line receiver to display charts from the National Oceanic and Atmospheric Administration and the Naval Meteorology and Oceanography Command, direct access to the World Meteorological Organization's data network, a color weather radar display, and a high resolution satellite receiver, all of which can be accessed via computer workstations. Students use all of these facilities in required courses as well as in their electives.

Curriculum Requirements (In addition to the requirements of plebe year)

Professional: NE203, NL302, NL400, NN204, NS310, NS40X;

Mathematics: SM221, SM219, SM212(M), SM311O;

Science: SP211, SP212, SP411;

Humanities: HH205, HH206 and two electives including one at the 300/400 level;

Engineering: EN200, EN300; plus either ES310, EE300, ES420 and a free elective, or ES300, ES410, EE311, EE312;

Major: SO231, SO234, SO344, SO345, SO414, SO416, plus four major electives; one free elective.

Oceanography Courses

SO221 Introduction to Oceanography (3-0-3). A descriptive course designed to provide an overview of significant oceanographic factors and their impact on engineering applications. *Prereq: Non-SOC majors only.*

SO231 General Oceanography I (3-2-4). A descriptive survey of and introduction to geological, chemical and physical oceanography. Course content spans subjects such as sea floor spreading, properties and composition of seawater and ocean currents and water masses. A historical perspective is provided. Laboratory exercises concentrate on Chesapeake Bay parameters as seasons change.

SO234 General Oceanography II (2-2-3). Continues introduction to physical oceanography, with emphasis on the interactions of physical processes in the oceans: geological, biological and chemical. Sediment distribution, characteristics, classification and sedimentation processes; marine volcanism and diagenesis; chemical properties of sea water, marine cycles and distribution of nutrients and gases in the oceans; marine productivity, diversity and the strategies employed by productivity, diversity and the strategies employed by marine organisms are included. *Prereq: SO231.*

SO244 Basic Atmospheric Processes (2-2-3). [*This course was formerly designated as SO344.*] An introductory course designed for oceanography majors, as well as those interested in taking advanced meteorological electives. This course treats the basic meteorological variables and instruments used for atmospheric measurements, physical processes governing the sun-earth-atmosphere thermal system, basic atmospheric thermodynamics, the chemical and temperature structure of earth's atmosphere, cloud and precipitation physical processes, basic atmospheric circulations and accompanying weather and climatic patterns, as well as an introduction to common meteorological data products used in weather analysis and prediction.

SO342 Introduction to Meteorology (3-2-4). An introductory course designed for general science majors, or others interested in taking advanced meteorological electives. This course treats the basic meteorological variables and

instruments used for atmospheric measurements, physical processes governing the sun-earth-atmosphere thermal system, cloud and precipitation physical processes, basic atmospheric circulations, and accompanying weather and climatic patterns, as well as an introduction to common meteorological data products used in weather analysis and prediction. *Prereq: Non-SOC majors only.*

SO345 Atmospheric Thermodynamics and Kinematics (3-2-4). A study of the thermodynamic and kinematic properties of the atmosphere, including the effects of temperature, moisture and wind processes, introduces the forces responsible for atmospheric motions. This course uses thermodynamic diagrams for analyzing vertical profiles of atmospheric variables, as well as conventional and remotely-sensed data to analyze horizontal distributions of meteorological fields. *Prereq: SO244.*

SO345H Honors Atmospheric Thermodynamics and Kinematics (3-2-4). Course is an advanced version of SO345 for honor students and includes laboratory exercises which will make extensive use of the Metlab computer system and applications software for meteorology. *Prereq: SO244.*

SO414 Oceanic and Atmospheric Processes (3-2-4). Fundamental equations of motion governing the dynamics of quasi-horizontal, inviscid and viscous fluid flow on the rotating earth are developed. Scale analyses of the basic hydrodynamic equations are used to identify forces responsible for motions of interest. Basic numerical modeling techniques for both oceanic and atmospheric processes are introduced. *Prereq: SO345, SM311(O).*

SO416 Waves and Tides (2-2-3). The dynamics of surface, internal, and capillary waves; wave statistics and spectrum; principles of wave forecasting; tide generating forces and tidal prediction; seiches, bores and surges are mathematically analyzed. *Prereq: SO414.*

SO422 Nearshore Oceanography (2-2-3). Examines the oceanographic regime from the continental shelf break to the intertidal zone and coastal dunes. Concentrates on shallow water wave, surf and beach processes. Includes a discussion of coastal management and engineering procedures. *Prereq: SO231 or SO221.*

SO426 Polar Oceanography (2-2-3). A descriptive course, which covers the history of polar exploration as well as the physical oceanography and meteorology of the Polar Regions with particular emphasis on the role of sea ice in global warming studies. Current DoD polar programs will be reviewed including the following: Deep Freeze, International Ice Patrol and Navy operations such as ICEX and TEAM-WORK. *Prereq: SO221 or SO231.*

SO427 Introduction to Estuarine Oceanography (2-2-3). The physical, geological and biological aspects of the estuarine environment are studied. Laboratory sessions, which include YP cruises and field trips, focus on practical and hands-on applications. Environmental issues such as water quality and pollution are discussed. The use of numerical models as a tool is explored. *Prereq: SO221 or SO231.*

SO431 Environmental Remote Sensing (2-2-3). An overview is given of the various platforms and sensors currently in use and planned. The electromagnetic spectrum and radiation laws are explained. Applications exercises give "hands-on" experience with image processing systems. *Prereq: SO221 or SO231.*

SO432 Concepts in Hydrography (2-2-3). Offers a general presentation of the fundamentals of hydrographic surveying, including geodesy, precise positioning afloat, error theory, depth measurement, tidal observations and shoreline mapping. The course includes practical applications of hydrographic surveying methods. *Prereq: SO221 or SO231.*

SO441 Synoptic Meteorology (2-2-3). A practical course in meteorological analysis and forecasting as applied to operational planning. A variety of meteorological datastreams available in the computerized Meteorology Laboratory are used to analyze and predict the current and future state of the atmosphere. *Prereq: SO342 or SO244.*

SO442 Tropical Meteorology (2-2-3). A study of the special processes affecting meteorological analysis and forecasting in the tropics, including satellite imagery analysis, with particular emphasis on hurricane or typhoon prediction, creation, movement and decay. *Prereq: SO342 or SO244.*

SO445 Global Climate Change (2-2-3). Global climate past and present is examined from the modern records using satellites, land/sea observations, ice cores, etc. Different global change model scenarios are presented and discussed for future climate - Earth Watch. Also studied are present day climate topics, such as the Ozone Hole, Greenhouse Effect and El Nino. *Prereq: SO342 or SO244.*

SO451 Biological Oceanography (2-2-3). A study of patterns and concepts of biological production in the ocean. Emphasis is on the integration of the biological and physical environment. Laboratory includes student

planned studies and conceptual exercises. All aspects of the course emphasize the use of various knowledge areas to solve a problem. *Prereq: SO234.*

SO461 Geological Oceanography (2-2-3). Introduces marine geological/geophysical instrumentation, theory, data collection, analysis, interpretation and applications. Geomorphology, structure, petrology, sedimentation, stratigraphy, origin and development of ocean basins and margins are examined in light of theory of plate tectonics. Practical studies of the Chesapeake Bay are part of the laboratory work. *Prereq: SO234.*

SO471 Chemical Oceanography (2-2-3). The modern approach to the ocean as a chemical system. Laboratory instruction emphasizes principles with appropriate methods. Classical concepts are discussed, as well as newer trends. *Prereq: SO234.*

SO49X Independent Research in Oceanography or Meteorology (1, 2, or 3 Credits). Students with a 3.0 minimum CQPR conduct independent research on a meteorological or oceanographic topic, culminating in a written report and a presentation to the faculty.

SO503 Honors Modern Methods in Oceanography and Meteorology (2-2-3). Statistical methods and techniques applied to research topics, oceanographic and laboratory instrumentation, remote sensing and mathematical modeling. Prepares students to undertake independent research in oceanography or meteorology. *Prereq: SOCH major or permission of department chair.*

SO50X Honors Independent Research (0-6-3). Independent research in oceanography or meteorology on a subject of the student's choice, culminating in a written report and a presentation to the faculty. *Prereq: SO503 and SOCH major.*

SO513 Honors Oceanic and Atmospheric Processes (3-2-4). Course is an advanced version of SO414 for honors students. *Prereq: SM311(O), SO345II.*

SO516 Honors Waves and Tides (2-2-3). Course is an advanced version of SO416 for honor students. *Prereq: SO513 and SOCH major.*





Department of Physics

Physics Major

The major program in physics presents fundamental physical concepts and principles in such a manner as to emphasize their general usefulness and lays a strong foundation for further work in a broad range of technical fields. The challenge of physics lies in uniting its laws and definitions, expressed through mathematics, with the integrative reasoning so essential in modeling and solving new problems. A bachelor of science degree is awarded.

Some of the topics treated in the sequence of courses are the origin, propagation and reception of waves of all kinds, field concepts, theory of relativity, mechanics, electromagnetic theory and quantum mechanics. All are studied with the object of developing an open-minded and creative approach to the physical world and problem solving—an approach increasingly important to those who will be the leaders in the Navy of the future. The physics major is excellent background for most of the major career paths in the U.S. Navy and Marine Corps. Recent major graduates have chosen the nuclear power program, Navy air, surface line and the Marine Corps. Opportunities for work toward advanced degrees are available to qualified physics majors prior to graduation, immediately after graduation and later in their careers.

In physics, laboratory work is emphasized and students will have access to eight laboratories for regular coursework and research that include special facilities for acoustics, atomic physics, nuclear physics, laser optics and solid state physics. There are also four faculty research laboratories, a photographic darkroom and well-equipped machine and electronics shops. Major instruments include a Pelletron accelerator, an 8-inch Clark refracting telescope and a 20-inch reflecting telescope, an anechoic chamber, electron magnetic resonance and nuclear magnetic resonance facilities, high resolution spectrographs, x-ray diffractometer, femtosecond and picosecond laser systems, a superconducting magnet, a helium dilution refrigerator, various cryogenic systems and numerous microcomputers for student use in data collection and processing.

Curriculum Requirements (In addition to the requirements of plebe year)

Professional: NE203, NL302, NL400, NN204, NS310, NS40X;

Mathematics: SM212, SM221, SM311P;

Humanities: HH205, HH206 and two electives including one at the 300/400 level;

Engineering: EE311, EE312, EN200, EM300, ES300, ES410;

Major: SP221, SP222, SP226, SP324, SP327, SP333, SP342, SP425, SP444, plus two physics electives;

Other: Math/Science/Engineering elective and one free elective.

Physics Courses

SP211 & SP212 General Physics I & II (3-2-4 & 3-2-4). These courses emphasize the fundamental principles of classical physics and introduce a variety of applications. Topics include mechanics, electricity, magnetism, wave motion, fluids, sound and light. Lectures, recitations, hands-on laboratories, and large-scale demonstration lectures are employed. *SP211* *Prereq:* *SC112 or SC151 or SC122; coreq: SM221 or SM223 or SM251 & SP212* *Prereq:* *SP211 or SP221 or permission of department chair.*

SP221 Physical Mechanics I (3-2-4). A first course in classical mechanics for physics majors. Newton's laws are applied to particles and systems of particles. Energy and momentum methods are developed. Applications include simple, damped, and driven harmonic motion as well as gravitation and orbital motion. *Coreq:* *SM221 or permission of department chair.*

SP222 Electricity and Magnetism I (3-2-4). A first course in electricity and magnetism for physics majors, with an emphasis on the concepts of fields and potential. The course culminates in the formulation of Maxwell's equations. *Prereq:* *SP221 or SP211.*

SP226 Heat, Sound and Light (3-2-4). A first course on the basic concepts of thermodynamics, acoustics, and optics for physics majors. Topics include heat engines, refrigerators, cosmology, the Doppler effect, beats, shock waves, fluids, lenses, telescopes, polarization, interference and diffraction. *Prereq:* *SP211 or SP221.*

SP301 Modern Physics (3-0-3). An introduction to the theories of relativity and quantum mechanics. Topics include relativistic mechanics, blackbody radiation, wave-particle duality, the Bohr theory, quantum phenomena, nuclear decay and nuclear reactions. *Prereq:* *SP212 or SP226.*

SP310 Astronomy (3-0-3). An introduction to the fundamentals of astronomy as a physical and mathematical science, covering stellar and galactic astronomy and both ancient and modern models of the universe. *Prereq:* *SP212 or SP226 or permission of chair.*

SP324 Physics of the Atom I (3-2-4). An introduction to the theory of quantum mechanics, with emphasis on the statistical interpretation. Topics include simple systems, mathematical formalism, hydrogen atom, and angular momentum. *Prereq:* *SP327, SP333, SM212; coreq: SM311 or permission of chair.*

SP327 Twentieth Century Physics (3-0-3). A study of the development of physics in the twentieth century, with particular attention given to relativity theory, quantum theory, and atomic physics. *Prereq:* *SP222 and SP226.*

SP328 Fluid Physics (3-0-3). A first course in classical fluid mechanics. Applies the conservation laws of mass, momentum, and energy to the problem of continuous fluids in motion, concentrating on incompressible flow dynamics, with attention to circulation, vorticity and turbulence. *Prereq:* *SP212.*

SP333 Physical Mechanics II (4-0-4). An intermediate course in physical mechanics for physics majors. Newtonian, Hamiltonian, and Lagrangian mechanics with special emphasis on the central force problem and noninertial reference frames. *Prereq:* *SP221 or SP211; SM212.*

SP342 Electricity and Magnetism II (4-0-4). An intermediate course in electromagnetic theory for physics majors. Maxwell's equations are formulated in the notation of vector analysis and applied to various situations. *Prereq:* *SP222, SM311.*

SP411 Underwater Acoustics and Sonar (3-0-3). A fundamental study of sound propagation in the ocean environment as it relates to the design and operation of sonar. Topics include wave mechanics, detection theory, Fourier analysis, ray tracing, waveguides, and scattering. *Prereq:* *SP212 or SP226.*

SP425 Physics of the Atom II (3-2-4). A second course in Quantum Mechanics. Topics include distinguishable and identical particles, atomic structure and spectral perturbation theory, nuclear structure and reactions, and fundamental particles. *Prereq:* *SP324, SM311.*

SP434 Nuclear Physics (3-2-4). A study of the basic static and dynamic properties of the nucleus and of the interaction of particles and radiation with matter. Emphasis on the experimental technique. Where appropriate, quantum mechanical interpretations of the phenomena are given. *Prereq:* *SP425.*

SP436 Acoustics (3-2-4). An introduction to modern acoustics. Topics include vibration and normal modes; coupled oscillators; discrete Fourier transforms; radiation, transmission and detection of sound waves; electroacoustics; psychoacoustics, architectural acoustics, musical acoustics and Sonar. *Prereq:* *SP212 or SP226 and SM212.*

SP438 Optics (3-2-4). An introduction to modern optics. Topics include polarization, interference, coherence, diffraction, Fourier transforms, holography, optics of solids and basic laser physics. *Prereq:* *SP342.*

SP442 Solid State Physics (3-2-4). An introduction to the physics of condensed matter. Topics include crystalline and noncrystalline solids, band theory, semiconductors, magnetism, and superconductivity. *Prereq:* *SP324 or permission of dept. chair.*

SP444 Thermal Physics (3-0-3). A presentation of topics in thermal properties of matter and radiation as derived from the laws of quantum mechanics and statistics. *Prereq:* *SP425 or permission of dept. chair.*

SP445 Astrophysics (3-0-3). A study of the physics of astronomical objects such as stars and galaxies. *Prereq:* *SM212, SP301 or SP324; SP310 or permission of dept. chair.*



Quantitative Economics Major

The major in quantitative economics is interdisciplinary, focusing on applications of mathematics to economic reasoning and economic problems. The major provides students with a broad set of mathematical tools and a solid background in economic theory. About half of the courses required are taken in economics; the other half are in mathematics. The major is jointly administered by the Departments of Mathematics and Economics. A bachelor of science degree is awarded.

Curriculum Requirements: (In addition to the requirements of plebe year)

Professional: NE203, NL302, NL400, NN204, NS310, NS40X;

Mathematics: SM223 and SM239;

Science: SP211, SP212;

Humanities: HH205, HH206 and two electives, including one at the 300/400 level.

Engineering: EN200, EM300; plus either EE300, ES310, ES420, and a free elective, or ES300, ES410, EE311, EE312;

Major: FE210, FE341, FE365, FE445, SM261, SM279, SM339, SA401, SA475E, and five major electives.

Division of Professional Development

The Division of Professional Development prepares midshipmen to be professional officers in the naval service. The courses offered by its academic departments —Leadership, Ethics and Law, and Seamanship and Navigation — develop skills in the classroom environment, on the water, in yard patrol training craft and in the academy's tactical training facilities. Through the Department of Professional Programs each midshipman moves out of the classroom to experience life at sea with operational fleet units.

Department of Leadership, Ethics and Law

Department of Professional Programs

Department of Seamanship and Navigation



The challenge to our country on the seas today is greater than ever before in our history, and only highly motivated, well educated, and thoroughly trained young men and women will be capable of helping our Navy to answer the challenge.

—VICE ADMIRAL WILLIAM P. MACK
Superintendent
U.S. Naval Academy, 1972-1975

Department of Leadership, Ethics and Law

The Department of Leadership, Ethics and Law presents a core of required courses, as well as electives in leadership, law, psychology, ethics and philosophy. All have the common objective of preparing midshipmen to lead as officers by providing the necessary principles and practical information to develop effective, personal leadership styles. Leadership courses are the cornerstone of the department, focusing on developing leadership practices consistent with the highest standards of professional ethics to enhance mission accomplishment and provide for high unit morale. The core courses also arm future junior officers with the practical legal information they will need in the fleet regarding discipline and military justice, law of the sea and the law of armed conflict. Psychology elective courses are designed to help midshipmen learn and understand what motivates others and themselves.

Leadership, Ethics and Law Courses: NL112, NE203, NL302, NL400

The following courses are offered as electives: NL200, NL211, NL306, NL311, NP230, NP232, NP336, and NP340

Leadership, Ethics, Law, and Psychology Courses

LEADERSHIP COURSES

NL112 Leadership and Human Behavior (2-0-2). Midshipmen examine fundamental tenets of leadership in the context of the theories and principles of individual and group behavior during their first semester. Topics include human development, followership, personality, motivation, performance enhancement, supervision and communication, as well as seminars with senior enlisted personnel and former commanding officers. The course instructors provide relevant personal and fleet based examples and emphasize interactive learning.

Prereq: 4/C standing.

NL302 Leadership: Theory and Application (2-0-2). Third year students continue to build on the concepts introduced in NL102, examining the leadership process by focusing on the dynamic interaction of "the leader, the followers, and the situation." The course uses readings by experts in the fields of military sociology, social psychology, organizational behavior and group dynamics in an application oriented and case study driven approach to bridging the experience gap between the students' roles as midshipmen and the challenges they will face as first tour naval leaders. *Prereq: 2/C standing.*

ETHICS COURSE

NE203 Ethics and Moral Reasoning for the Naval Leader (3-0-3). This course is structured around classical and contemporary writing in moral philosophy. Current and historical case studies are used to show how these fundamental ideas can be applied to the service of the professional military leader. *Prereq: 3/C standing.*

LAW COURSE

NL400 Law for the Junior Officer (2-0-2). A survey of the major aspects of military justice, administrative law, law of armed conflict, and law of the sea relevant to the junior naval officer. *Prereq: 1/C standing.*

PSYCHOLOGY COURSES

NL200 Human Behavior (3-0-3). An introduction to the science of psychology, this course covers the theories and principles of individual and group human behavior. Topics include learning, personality, social psychology, memory, human development, brain-functioning, health psychology and psychopathology. This course emphasizes research-based discoveries in the field of psychology. Students are

prepared to critically evaluate behavioral science research and apply salient principles to leadership.

NL211 Social Psychology (3-0-3). This course focuses on human behavior in the social context. How individuals influence and are influenced by groups, as well as the field of group dynamics will be examined. Emphasis is placed on research-based findings in the areas of causal attribution, social perception, interpersonal attraction, attitudes and attitude change, group dynamics, prosocial behavior and aggression. Particular emphasis is given to application in the military setting.

NL306 Personality (3-0-3). This course offers an exploration of major influences on the development of personality from both theoretical and clinical perspectives. Theories covered include psychoanalytic, behavioral, cognitive, humanistic and biopsychosocial. This course addresses contemporary research and practice relative to assessment and understanding of personality traits, styles and disorders. Midshipmen will examine their own personality assets and liabilities and implications for leadership.

NL311 Psychology of Leadership (3-0-3). This is an intensive and experientially-focused course that emphasizes leader self-analysis and skill development. Areas covered include personnel management, team development and performance enhancement at both individual and group levels. Research findings from industrial/organizational consultation, learning, motivation, social behavior, group dynamics, personality, counseling, social perception and interpersonal influence will provide the undergirding for developing knowledge, attitudes and skills which contribute to effective leadership.

NL312 Abnormal Psychology (3-0-3). Explores the origins, symptoms, diagnosis and management of psychological disorders. Midshipmen gain an understanding of the root causes of psychological disturbance, including personality disorders. The cognitive, emotional, behavioral and cultural manifestations of these disorders are explored. Strategies for effective prevention and management of psychopathology in operational environments are addressed. Midshipmen also learn techniques for rapid assessment and triage of psychiatric crises.

PHILOSOPHY COURSES

NP230 Introduction to Philosophy (3-0-3). This course gives you a chance to hone your discussion, debating, critical thinking and persuasive writing skills by arguing about some of

the great perennial questions pursued by thoughtful men and women in every age and culture. These may include: Are our lives directed by fate/destiny, or do we have free will? Do we have certain knowledge of anything at all? What is truth? Is there a distinction between mind and brain? When you wake up in the morning how do you know that you are the same person you were yesterday? As the Greek philosopher Socrates once said, "The unexamined life is not worth living." Come explore life through the works of great philosophers, from Plato to Descartes to David Hume.

NP232 Military Ethics: The Code of the Warrior (3-0-3). Why do warriors fight? How do they fight? What should bring a warrior honor? What should bring them shame? What is really worth dying for? There have been special warrior cultures in countless societies across the globe, through every era in history. Were these warriors just killers, or did they have their own unique codes of behavior? This course explores several warrior traditions: the Ancient Greeks, the Vikings, the Romans, the Celts, Knights and Chivalry, African Tribesmen, Native American Warriors, Chinese Warrior Monks, Japanese Samurai, and 20th Century warriors, and applies the lessons of their experience and warrior philosophy to the task of creating the ideal code for warriors of the new millennium.

NP336 Philosophy of Religion (3-0-3). This class provides a focused introduction to philosophical questions that arise about religion and in the pursuit of religious ideals. Whether you are a person of strong faith from any religious tradition or an agnostic or an atheist, you will enjoy investigating and debating questions and topics such as these: Arguments for the Existence of God, Do Miracles Occur?, What is the Source of Evil?, What Happens When We Die?, Faith and Reason, Faith and Scientific Knowledge, Religious Pluralism, and the Relationship Between Religion and Ethics. One way or another, these issues affect us all. *Prereq: 1/C or 2/C only, or permission of chair.*

NP340 Philosophy of Science (3-0-3). (*required of General Science majors*) This course treats the historical development of science and the emergence of the modern scientific method, and examines some of the great challenges facing scientists at the close of the present century. What drives dramatic paradigm shifts in scientific fields? Is scientific inquiry ever really objective and detached? How are scientific theories evaluated? Come explore the philosophies behind the formulas. *Prereq: 1/C or 2/C or permission of chair.*



Department of Professional Programs

The Department of Professional Programs performs three primary functions: administration of the summer training programs, assignment of graduating midshipmen to Navy and Marine Corps communities, and technical support for Luce Hall.



Department of Seamanship and Navigation

The Department of Seamanship and Navigation provides midshipmen with the skills necessary to be an impact player in the fleet. The department's core curriculum spans all four years at the Naval Academy and is designed to provide a solid theoretical foundation, reinforced through summer training cruises.

The ideal condition would be, I admit, that men should be right by instinct; but since we are all likely to go astray, the reasonable thing is to learn from those who teach.
—SOPHOCLES



Seamanship and Navigation Courses

Navigation Course

NN204 Navigation and Piloting (2-2-3). Third class midshipmen build on concepts learned in NS100. This course introduces terrestrial, celestial and electronic navigation. *Prereq: NS100 and LANTPAT.*

Naval Science Courses

NS100 Fundamentals of Naval Science (3-2-4). Fourth class midshipmen are introduced to the basic concepts of seamanship, ship handling, coastal piloting and engineering. The course includes at-sea labs on 108' Yard Patrol Craft (YPs).

NS310 Strategy and Tactics (1-2-2). Midshipmen second class receive instruction in the development of modern maritime strategy as it relates to the current applications of the United States global and general maritime strategic doctrines. Instruction

includes multi-ship operations, basic warfare tactics and naval force tactical planning. The application of basic warfare tactics will be accomplished in the fleet command tactical scenario laboratory.

Junior Officer Practica

First class midshipmen are required to complete one of the following courses which are tailored towards the major warfare specialties available upon graduation:

NS401 Junior Officer Practicum (Surface) (1-2-2). A course to provide information on the duties and responsibilities required of a junior officer in the surface community. Instruction includes operational procedures and practical applications of leadership and management principles tailored to the surface force. *Prereq: 1/C standing.*

NS402 Junior Officer Practicum (Submarine) (1-2-2). A course to provide information on the duties and responsibilities required of a junior officer in the submarine

community. Instruction includes operational procedures, and practical applications of leadership and management principles tailored to the submarine force.

Prereq: 1/C standing.

NS403 Junior Officer Practicum (Aviation) (1-2-2). A course to provide information on the duties and responsibilities required of a junior officer in the aviation community. Instruction includes air navigation, tactics, operational procedures and practical applications of leadership and management principles tailored to the aviation force. *Prereq: 1/C standing.*

NS404 Junior Officer Practicum (Marine Corps) (1-2-2). A course to provide information on the duties and responsibilities required of a junior officer in the Marine Corps. Instruction includes land navigation, tactics, operational procedures and practical applications of leadership and management principles tailored to the Fleet Marine Force. *Prereq: 1/C standing.*

*Tell the men to fire faster
and not give up the ship.
Fight her till she sinks.*

—JAMES LAWRENCE

*The winds and the wave
are always on the side of the
ablest navigator*

EDWARD GIBSON



USNA Sailing

The Robert Crown Sailing Center provides midshipmen with instruction in leadership, marlinspike seamanship, small boat seamanship, and competitive sail boat racing. Beginning with Plebe Summer Sailing (P-100), midshipmen are introduced to the fundamentals of the nautical art of sailing. Sailing instruction includes three phases: lasers, small keel boats and ocean-capable sloops. After twenty-seven hours of sailing instruction, a plebe can “skipper” a small keel boat and earns a Navy Sailing “B” qualification. The following summer, third class midshipmen have the opportunity to participate in advanced offshore sail training with the Command Seamanship Training Squadron (CSTS). During first class summer, midshipmen are eligible to command a large offshore sail training craft. In addition to professional training, the Intercollegiate Sailing Team and the Varsity Offshore Sailing Team provide midshipmen with an opportunity to participate in NCAA and ICYRA competitive sail racing throughout the four-year curriculum. While producing 66 All-Americans, the Intercollegiate Team has amassed a total of 28 national championships, including three consecutive coed national titles.

Academy-Wide Seminars, Research Projects and Interdisciplinary Courses

Academic departments may offer seminars and individual research projects to upperclassmen on the following basis:

Seminars:

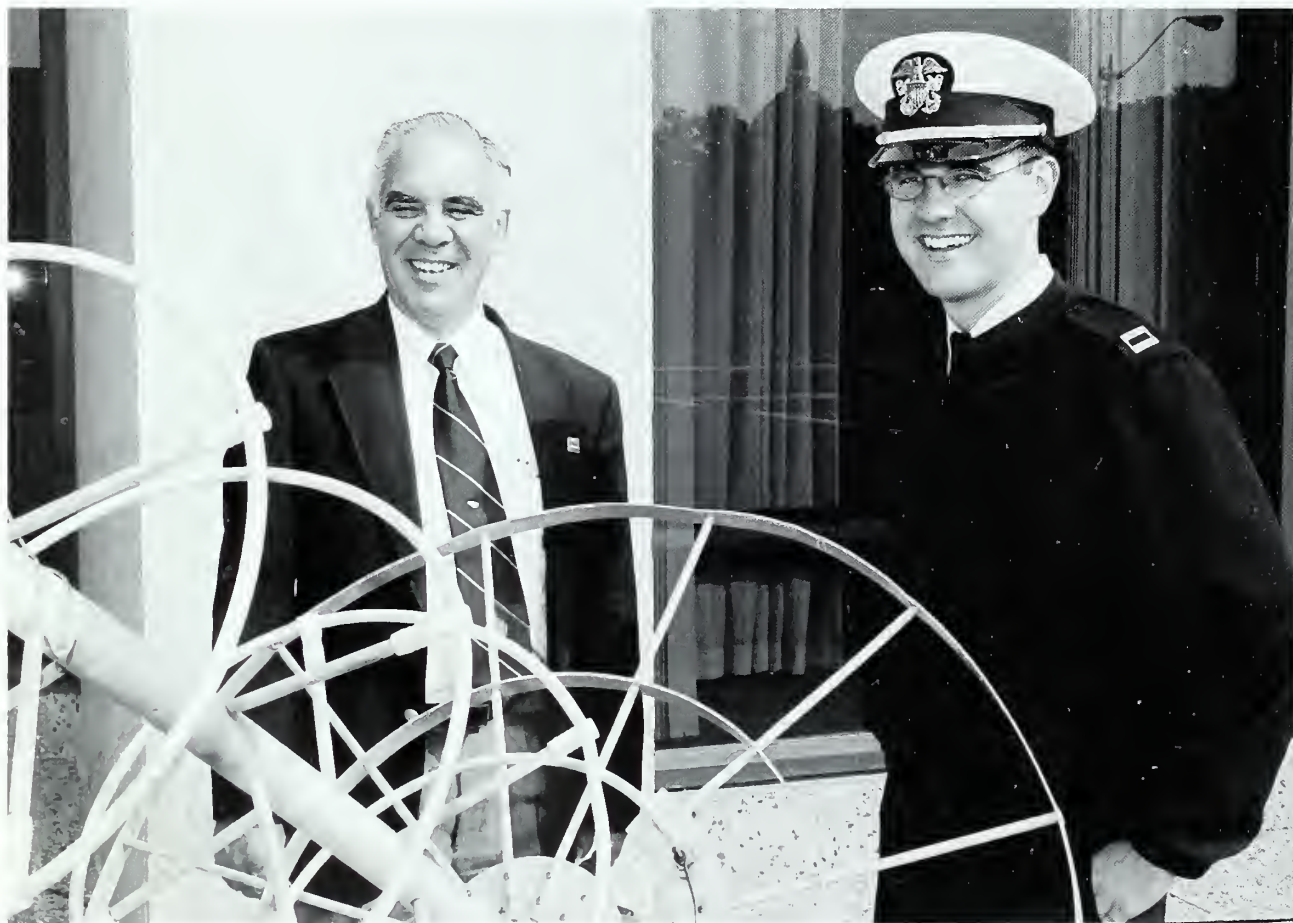
XX 481 and XX 482	1-0-1
XX 485 and XX 486	3-0-3 Advanced topics

Research projects:

A creative project in the student's field of interest. A faculty adviser must approve and monitor each project. *Prerequisite: approval of department chairman and Associate Dean for Academic Affairs.*

XX 491 and XX 492	0-2-1
XX 493 and XX 494	0-4-2
XX 495 and XX 496	0-6-3

Note: XX represents the departmental designator.







Athletics

Just as the Naval Academy promotes the professional and intellectual development of midshipmen, so also must it fulfill its responsibility for each midshipman's physical development. This is met through an intercollegiate sports program that is one of the broadest in the nation—21 men's and nine women's varsity teams—and an equally ambitious intramural and club sports program. All midshipmen are required to participate in these programs, either at the varsity, intramural or club level.

Vice Admiral William P. Lawrence, former superintendent of the Naval Academy and an ex-POW in Vietnam, once noted: "I think there is one characteristic of the American people that contributes immensely to the greatness of our country and that's our dedication to excellence in every way of American life. And I think we attach a high degree of significance to excellence in physical fitness. Intercollegiate sports more or less represent the ultimate in excellence in amateur sports—that's one of the real values of intercollegiate athletics. It's great for the spirit and morale of the country to have this demonstration of physical excellence at the collegiate level. Intercollegiate sports impart those values a military leader must have to a large degree." Admiral Lawrence has been the recipient of two of this nation's most prestigious athletic awards—the National Football Foundation and Hall of Fame's Gold Medal and the Theodore Roosevelt Award from the National Collegiate Athletic Association (NCAA).

The roll call of varsity "N" winners at the Naval Academy reads like a veritable Who's Who in America—Rear Admiral Alan B. Shepard, the first American in space and a member of the heavyweight crew; Admiral Stansfield Turner, ex-football lineman who became director of the Central Intelligence Agency; Admiral Arleigh Burke, a wrestler who later was Chief of Naval Operations; Rear Admiral Richard Byrd, the polar explorer who captained the Navy gymnastics team; Fleet Admiral Chester Nimitz, also a former Navy oarsman; and Fleet Admiral Bull Halsey of World War II fame, a football player at the academy. In recent years, the names have been Heisman Trophy winners Joe Bellino and Roger Staubach, football greats Phil McConkey and Napoleon McCallum who went on to play in the National Football League; and the 1987 Collegiate Basketball Player of the Year, David Robinson.

Robinson, who powered the midshipmen to the NCAA basketball tournament three straight years in the 1980s, was named the National Basketball Association "Rookie of the Year" in 1990 and was a member of the 1992 and 1996 U.S. Olympic gold medal basketball teams. He was the NBA scoring leader for the 1993-94 season and was named the NBA's Most Valuable Player for the 1994-95 season.



The Naval Academy made me a successful man not only for football but for life. And to develop yourself as a man is the most important thing for everyone.

—ROGER STAUBACH

Over the years, Navy teams have been successful in both national and international arenas. Midshipmen football teams have participated in the Rose, Sugar, Cotton, Orange, Holiday, Liberty and Aloha Bowls, and Navy's football rivalry with Army is the greatest amateur football rivalry in America.

In addition to the medal-winning crews, Navy athletes over the years have been frequent medal winners in the Olympics. Lloyd Keaser, a 1972 graduate, won a silver medal in wrestling in the 1976 Olympics, and David Robinson earned a Bronze Medal in men's basketball at the 1988 games in addition to the Gold in 1992 and 1996.

In 1998-99, Navy sports teams compiled a record of 250-140-4 (.640), including a 25-7 (.781) record against Army. The Naval Academy produced 12 All-Americans, seven Athletes of the Year and seven different teams won conference championships.

The Naval Academy's sailing team provides midshipmen with opportunities to develop leadership and seamanship skills through competition in numerous intercollegiate and private regattas. Competition ranges from single-handed Lasers to 50-foot ocean racers with a crew of 14. The academy sponsors many of these regattas, including the McMillan Cup and the John F. Kennedy Memorial Regatta.

Jack Lengyel became the 27th director of athletics at the Naval Academy in July 1988. His first association with the academy came earlier when sons David and Peter graduated in 1980 and 1984, respectively. Lengyel held posts as athletic director at the University of Missouri and Fresno State University and coaching positions at the University of Akron, Heidelberg College, Cornell University, College of Wooster and Marshall University. A graduate of Akron, Lengyel was a letter-winner in football, lacrosse, swimming and track. He earned a master's of education degree from Kent State University.



“At the Naval Academy, the athletic program is not just an extracurricular activity, it is part of the mission and as such receives a priority much different than at a civilian school. The athletic teams are an integral part of the overall education of a total person. Athletics can provide leadership opportunities, and the experiences of team play, cooperative effort, sportsmanship, commitment and individual sacrifice for goals that some may or may not be able to achieve. Athletics and competition are a big part of every midshipman's life at the Naval Academy.

“In our program everyone has a wide variety of athletic choices, as well as the required physical education curriculum. The primary goal of the physical education curriculum is fitness, which is so vital for health, personal appearance and well-being.

“We hope to interest and insure proficiency in what we call ‘carry-over’ sports that our young men and women can enjoy for a lifetime, such as tennis, golf, squash, and swimming. The Naval Academy has excellent facilities for all midshipmen to gain the necessary skill levels for lifetime enjoyment.”



Intercollegiate and Intramural Athletics

Men's varsity sports

Baseball
Basketball
Crew, heavyweight
Crew, lightweight
Cross country
Football
Golf
Gymnastics
Lacrosse
Sprint Football
Rifle (co-ed)
Intercollegiate Sailing (co-ed)
Offshore Sailing (co-ed)
Soccer
Squash
Swimming
Tennis
Track, indoor
Track, outdoor
Water polo
Wrestling

Women's varsity sports

Basketball
Crew
Cross country
Intercollegiate Sailing
Soccer
Swimming
Track, indoor
Track, outdoor
Volleyball

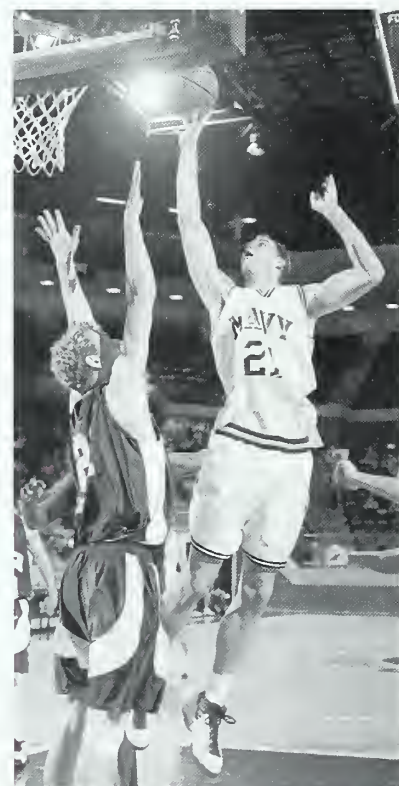


Intramural sports program

An equally exciting intramural sports program is organized by the Physical Education department for other midshipmen student-athletes. Competition at the intramural level is spirited, sometimes intense and allows all midshipmen to compete at a level appropriate to their individual athletic ability. Women may participate in all intramural sports except fieldball. Company teams compete in a variety of sports including:

Basketball	Soccer
Fieldball	Street Hockey
Flag Football	Volleyball
Racquetball	Wallyball
Slow-pitch softball	Weightlifting

In addition to the varsity and intramural athletic programs, students attending the Naval Academy can join such club sports as: boxing, rugby, pistol, cycling, judo, karate, men's ice hockey and volleyball, men's and women's lacrosse, powerlifting, women's softball, tennis and gymnastics.

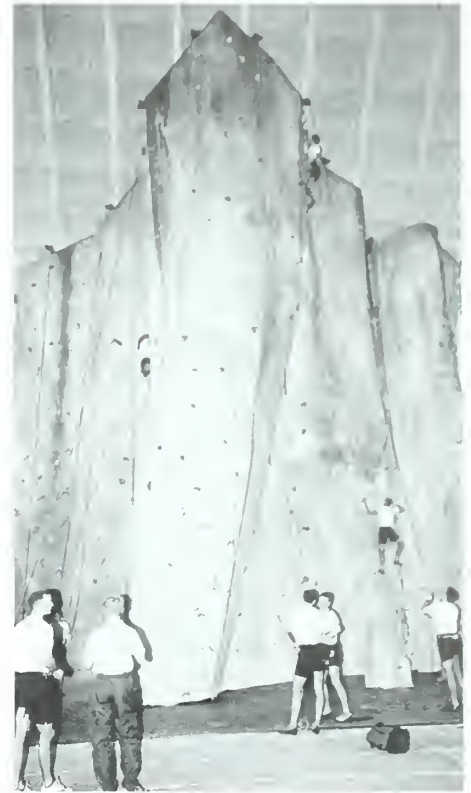


Athletic Facilities

In looking around the Academy, you can easily determine the importance attached to athletics and physical conditioning. The facilities for intercollegiate and intramural sports, physical education and personal fitness are unsurpassed and not reserved for just a few athletes. All midshipmen have access to these facilities, for team sports or individual workouts:

- the 36,000-seat Navy-Marine Corps Memorial Stadium;
- Alumni Hall, completed in 1991 with seating of 5,710 for athletic contests and adaptable for lectures, assemblies, theatrical productions, concerts and official ceremonies;
- Ricketts Hall, renovated and expanded in 1995, with a new and larger football locker room, a modern physical training facility, an up-to-date 12,000 sq. ft. weight room and office areas for the Naval Academy Athletic Association.
- Lejeune Hall, built in 1982, containing an Olympic-sized pool with seating for 1,000, diving platforms and tank, 600-seat wrestling arena and personal conditioning areas;
- a 400-meter synthetic-surfaced outdoor track;
- MacDonough Hall, with facilities for gymnastics, boxing, volleyball, swimming, water polo, racquetball, basketball and a newly refurbished weight room for personal conditioning;
- Halsey Field House, synthetic-surfaced throughout, includes a 220-yard track, basketball courts, aerobics area, a newly renovated weight training room with 52 pieces of new equipment including ellipticals, stair climbers, cycles, and rowing machines, and a portable wooden basketball floor;
- Halsey Climbing Wall is 40 feet high with 3200 square feet of climbing surface, has an 8-foot bouldering cave and 1600 moveable handholds, which provide for limitless configurations;
- Hubbard Hall, the home for Navy's crew squads, with the state-of-the-art Fisher Rowing Center;
- Rip Miller Field, an all-weather synthetic-surfaced field for football, lacrosse and soccer;
- a 5,000-seat baseball field which was upgraded in recent years and includes the FitzGerald Baseball Clubhouse, completed in 1995;
- a challenging 6,217-yard golf course.

The athletic program is administered by the Naval Academy Athletic Association, a non-profit organization with headquarters in Ricketts Hall. The athletic association arranges varsity schedules and provides coaching staff and equipment, and funding for the varsity athletic program.





Career Opportunities After Graduation

Graduation from the Naval Academy brings new opportunities for leadership, learning, professional advancement, travel and excitement. From your very first assignment as an officer in the naval service you will have more responsibility and challenge on the job than almost any civilian just out of college. Also, naval officers have key roles in implementing the nation's maritime strategy, a forward-based and multi-service strategy designed to deter aggression, support allies and protect U.S. interests overseas.

Your service commitment begins at graduation, when you are commissioned as an ensign in the Navy or a second lieutenant in the Marine Corps. All physically qualified graduates are commissioned into the unrestricted line of the Navy or Marine Corps. Most midshipmen who graduate but are physically ineligible to serve in the unrestricted line are commissioned in a restricted line specialty such as Intelligence, Supply Corps or Civil Engineer Corps.

Service Assignment

The career options available to Naval Academy graduates are the **broadest offered** by any of the nation's service academies. You can:

- specialize in surface warfare, with assignments in ships ranging from minesweepers to guided missile cruisers;
- enter the submarine service, with duty in nuclear-powered attack and ballistic missile submarines;
- fly a variety of aircraft from helicopters and shore-based patrol planes to supersonic, aircraft carrier-based jet fighters;
- work with nuclear propulsion systems, powerful computers and sophisticated weapons systems in locations around the world;
- command infantry, armor, artillery or aviation units as a Marine Corps officer; and
- lead the most talented and highly motivated Sailors and Marines in the world, no matter what career path you choose.

The U.S. Naval Academy has produced:

- 1 President of the United States
- 1 Nobel Prize winner
- 18 members of Congress
- 4 state governors
- 4 Secretaries of the Navy
- 1 Secretary of the Air Force
- 3 Chairmen of the Joint Chiefs of Staff
- 2 Vice Chairmen of the Joint Chiefs of Staff
- 25* Chiefs of Naval Operations
- 8 Commandants of the Marine Corps
- 73 Medal of Honor winners
- 51 NASA Astronauts
- 34 Rhodes Scholars
- 12 Marshall Scholars
- 76 Olmsted Scholars
- 674 Burke Scholars
- 17 FitzGerald Scholars

*Sign on and Sail with me.
The stature of our homeland is
no more than the measure of
ourselves. Our job is to keep
her free. Our will is to keep
the torch of freedom burning
for all. To this solemn purpose
we call on the young, the
brave and the strong, and the
free. Heed my call. Come to
the sea. Come Sail with me.*
—JOHN PAUL JONES

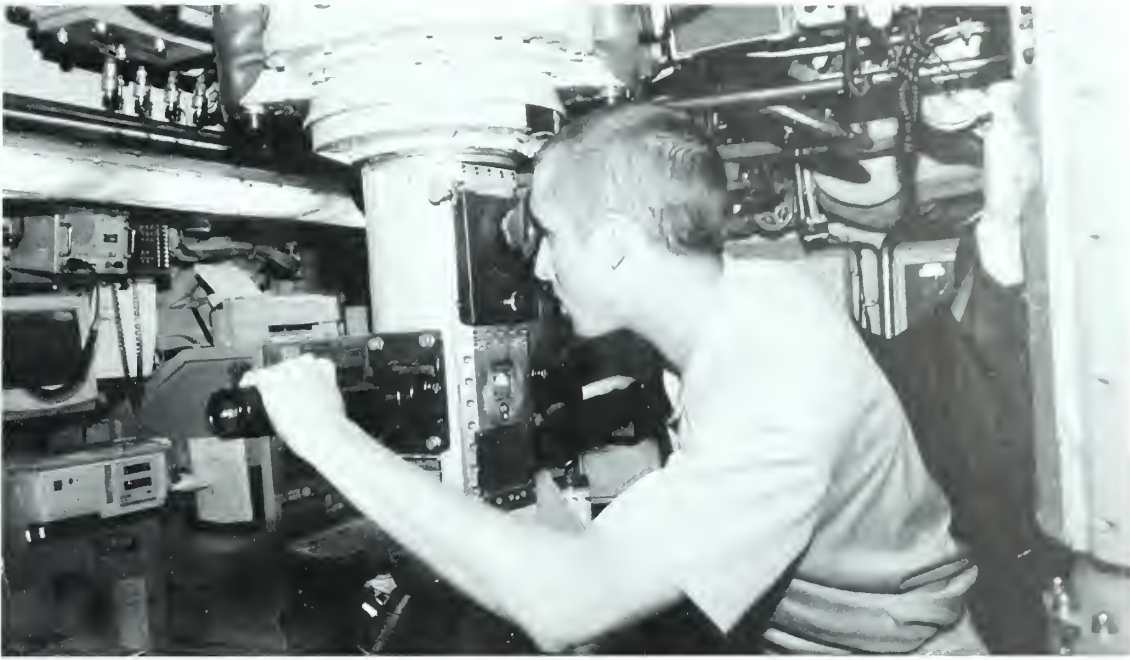
You will be given the opportunity to state your career preference early during the first semester of your senior year. Actual assignment to that community is based upon your overall record at the Naval Academy, personal and physical qualifications, and the needs of the Navy and Marine Corps.

Surface Warfare

Surface warfare officers serve in every type of surface ship in the Navy. When you are selected for surface warfare, you have the opportunity to choose the type of ship and home port of your first duty assignment. Then, after graduation from the academy, you attend a six-month Surface Warfare Officer School in Newport, R.I., before reporting to your ship. Your first tour of duty lasts about 24 months.

A new ensign typically serves as a division officer, with responsibilities for leading 12 to 50 enlisted personnel and directing a portion of the ship's equipment and operations. Typical positions include those of anti-submarine warfare officer, gunnery officer, communications officer and damage control assistant. In addition, you are expected to work toward qualification as combat information center watch officer, officer of the deck and Navy surface warfare officer.





Knowledge of the ocean is more than a matter of curiosity; our very survival may hinge on it.

—PRESIDENT JOHN F. KENNEDY

Submarine Force

Those assigned to the silent service begin by studying Navy nuclear propulsion at Nuclear Power School in Charleston, SC, for six months of schooling, followed by six months of training at one of several nuclear reactor prototype sites located throughout the country. You then go to Navy Submarine School in New London, Conn., for the 10-week submarine officers basic course. Your first tour of duty with an attack or fleet ballistic missile submarine lasts about 36 months.

In a nuclear submarine, junior officers lead divisions of 10 to 20 men. You have responsibilities in a vital area of operations such as engineering, weapons or communications. You also stand watches and work to qualify as engineering officer of the watch, diving officer and officer of the deck—all steps towards earning the gold dolphins of a Navy submarine officer.

Nuclear Propulsion

The Navy's demanding and highly technical nuclear power training program is among the best in the world. Those chosen for the program usually rank high in their class and have a solid background in scientific and technical courses, though not necessarily majors in these areas.

Midshipmen who choose surface warfare can join those choosing submarines in pursuing a sub-specialty in nuclear propulsion systems. If you are accepted into the nuclear power program, you report to Nuclear Power School in Charleston, SC, for six months of schooling following your first division officer tour. You then train for six months at one of several nuclear reactor prototype sites located throughout the country before reporting to your second ship.

All of the Navy's submarines are nuclear-powered. Most aircraft carriers are nuclear powered and surface warfare officers alternate between these and conventionally powered ships as they advance in their careers.

Naval Aviation

Whether landing an F/A-18 Hornet on the deck of an aircraft carrier, hunting an enemy submarine in the North Atlantic in a P-3 Orion or maneuvering an SH-60F helicopter in a rescue operation, naval aviators are constantly called upon to perform under pressure. When you are assigned this career path, you can select training as a pilot or a naval flight officer. Pilots fly aircraft while naval flight officers serve as bombardiers, navigators, radar and electronic intercept officers and antisubmarine warfare systems specialists.

After graduation from the Academy, all those choosing aviation report to Pensacola, Fla., for Aviation Preflight Indoctrination. Pilot trainees may either stay in Pensacola or move to Corpus Christi, Texas, for basic flight training. Depending on the type of aircraft/training track chosen after basic, pilots may complete advanced training in Pensacola; Corpus Christi; Meridian, Miss.; or Beeville, Texas. Naval flight officers (NFOs) complete all of their flight training in Pensacola. Aviators receive their 'wings of gold' after 18-24 months for pilots and 12-18 months for NFOs. They are assigned to their first squadron after six to nine months of aircraft and mission-specific training in a fleet replacement squadron.

*No man needs sympathy
because he has to work,
because he has a burden to
carry. Far and away the
best prize that life offers is
the chance to work hard
at work worth doing.*

—THEODORE ROOSEVELT

In addition to flying, naval aviators have significant leadership and management responsibilities beginning with their very first duty assignment. New officers typically are charged with leading a group of aviation enlisted personnel and overseeing various aspects of their squadron's operations, administration, personnel management or aircraft maintenance.





*Among the men who fought
on Iwo Jima, uncommon
valor was a common virtue.*

—ADMIRAL CHESTER W.
NIMITZ

Marine Corps

Up to one-sixth of each graduating class may be chosen for commissioning as second lieutenants in the Marine Corps. After graduation from the Academy, you attend the Basic School, a 26-week course for officers at Quantico, Va. This school gives all Marine officers a common background in the tactical study of land warfare. Then you go on to advanced training in a particular occupational specialty based on your qualifications and preferences.

Marine Corps career fields include those in the two basic categories of ground and air. Ground career choices include infantry, armor, artillery, logistics, engineering, communications-information systems, financial management and military police. Aviation choices include pilot, naval flight officer, air command and control, anti-air warfare, aviation maintenance and aviation supply.

In their first assignments, Marine Corps second lieutenants are generally assigned as platoon commanders with leadership responsibilities for 35 to 43 enlisted Marines. You often have a role in a Marine air/ground task force, with Marine light infantry capable of opposing much more heavily equipped forces. Meshing of air and ground officers in these task forces and individual units gives officers the opportunity later to command combined units, not just within career specialties. Marine officers are assigned all over the world.

Special Operations and Special Warfare

Special Operations, the newest warfare community was approved by the Secretary of the Navy in July 1978 in recognition of a need for sustained, progressive, cost-effective and ready capability in four functional areas: Explosive Ordnance Disposal (EOD), Mine Countermeasures (MCM), Operational Diving and Salvage (ODS), and Explosive Ordnance Management (EOM). Explosive Ordnance and diving provide the common base which assures compatibility of the four functional areas. Special Operations offers men and women an exciting career and command opportunity in a small specialized community.

Special Warfare provides qualified officers the opportunity to be a member of one of the world's elite fighting forces. As a branch of the U.S. Special Operations Forces, Navy SEALs are known and respected around the world.

Restricted Line and Staff Corps Specialties

Midshipmen who are not physically qualified to serve in the warfare areas but who can be commissioned as active duty officers can choose from a wide variety of alternatives and pursue a career all the way to the flag officer rank of admiral. Restricted line and staff corps officers may choose careers in the fields of intelligence, cryptology, oceanography, medicine, civil engineering, supply and aviation maintenance. They serve aboard ships, with aircraft squadrons and at shore bases around the world. Graduating midshipmen who are accepted to medical school may be commissioned in the Medical Corps even if physically qualified to serve in the unrestricted line.

Assignments for Women

For female officers in the Navy and Marine Corps, many options are open to you to serve in assignments vital to our national defense. You may fly planes as a pilot or naval flight officer or drive ships as a surface warfare officer. The Navy is now assigning women to combat vessels following the repeal of the combat exclusion law (Section 6015, Title 10, U.S.Code). Following training, you would be assigned aboard a variety of Navy ships including cruisers, destroyers, aircraft carriers, dock landing ships, oilers, tenders, frigates and supply ships in the Atlantic or Pacific fleets or in aircraft.

Women may also enter restricted line or staff corps specialties such as oceanography, intelligence, supply or civil engineering if not physically qualified for aviation, ships or Marine Corps.

You also may choose to enter the Marine Corps. Women Marine Corps officers can be assigned to all career fields available to male officers, except infantry, artillery and armor.

A very limited number of billets in medicine are available each year to both male and female graduates who are accepted for admission by an accredited medical school.

Skill in naval affairs, as in other crafts is the result of scientific training. It is impossible to acquire this skill unless the matter be treated as of the first importance and all other pursuits are considered to be secondary to it.

—THUCYDIDES



Commander Wendy Lawrence, USN
USNA Class of 1981
Mission Specialist, NASA



Career Choices of the Class of 2000

The 933 members of the Class of 2000 chose the following service and warfare specialties to enter after graduation and commissioning:

Aviation: Pilot training — 217 men and 18 women;
Naval Flight Officer training — 92 men and 10 women

Surface Warfare: conventional — 144 men and 65 women;
Nuclear power — 28 men and 16 women

Marine Corps: 139 men, 18 women

Submarine warfare: 123 men

Navy Restricted Line and Staff Corps: 20 men and 2 women,
including men not physically qualified for the unrestricted line duties above, elected
specialization in aviation maintenance duty, cryptology, intelligence, supply corps,
civil engineer corps and meteorology/oceanography

Medical Corps: 12 men, 1 women

Special Warfare (SEAL): 16 men

Special Operations (diving, salvage and explosive ordnance disposal):
10 men, 1 women

Interservice commissioning in the U.S. Air Force: 2 men

An officer is much more respected than any other man who has so little money.

—SAMUEL JOHNSON

Typical Pay and Allowances for Junior Naval Officers

This table shows the approximate pay and allowances of Navy and Marine Corps junior officers. Promotion to Navy lieutenant (junior grade) or Marine Corps first lieutenant normally comes two to three years after commissioning. The next promotion, to Navy lieutenant or Marine Corps captain, normally comes two years after commissioning. All of these figures, including cost-of-living increases, are subject to change.

Monthly Pay and Allowances

	ENS/2nd LT	LTJG/1st LT	LT/CAPT
Base Pay	\$1,997.20	\$2,620.80	\$3,489.30
Subsistence	\$ 159.00	\$ 159.00	\$ 159.00
Housing Allowance*	\$ 694.00	889.00	\$1,051.00
	(single)		(single)
	\$ 951.00	\$1,114.00	\$1,331.00
	(family)	(family)	(family)
Flight Pay**	\$ 125.00	\$ 156.00	\$ 188.00
Submarine Pay**	\$ 175.00	\$ 235.00	\$ 355.00
Nuclear Power Incentive	\$ 10,000 upon completion of nuclear power training		

* *Varies based on rank and location assigned. Figures here represent amounts for junior officers living in Annapolis, MD.*

***Amounts shown are approximate and will increase with each year in service.*



*Cease firing, but if any
enemy planes appear,
shoot them down in a
friendly fashion*

ADMIRAL WILLIAM F.
"BULL" HALSEY



After Your First Tour of Duty

By the time you complete your first tour of duty, you will probably have a pretty good idea about your career goals, and the Navy and Marine Corps will give you every opportunity to achieve them. You will have assignments to prepare you for advancement and command of a surface ship, submarine, aircraft squadron, Marine Corps unit or an organization ashore.

Naval officers alternate between tours of duty with shore-based units and operational commands that deploy overseas in support of our nation's maritime strategy. You also have the opportunity for postgraduate study, advanced technical training in your specialty and coursework at military service colleges in leadership, management, tactics, strategy, politico-military affairs and international relations. You never stop learning, even as your responsibilities for people, operations and policy-making increase.





Organization

The Naval Academy is organized much like a civilian college. The Board of Visitors, similar to a college board of trustees, provides the collective views and recommendations of the Board to the Superintendent concerning the Naval Academy. The Academy's Superintendent, a Navy admiral, is the equivalent of a college president in that he oversees all of the school's functions.

The Superintendent's principal deputies include a civilian Academic Dean, who oversees the academic program and the faculty, and the Commandant of Midshipmen, a Navy admiral who serves as dean of students and supervisor of all military and professional training.

The Superintendent, Commandant, Academic Dean and academic division directors sit on the academic board, which sets the Academy's academic standards. The Naval Academy's 590-member faculty is composed of an equal number of civilian scholars and experienced military officers. The civilian professors give the academic program continuity and a foundation of scholarship and teaching experience. The officers, who rotate every two or three years, bring fresh experiences and ideas from operational and staff assignments in the Navy and Marine Corps.

The Deputy for Operations is the Superintendent's principal assistant for all administrative and operational matters. The Deputy for Operations, in concert with the Commandant of Midshipmen and Academic Dean, coordinates activities and events among the various departments and divisions at the Naval Academy and Annapolis complex.



Nobody can actually duplicate the strain that a commander is under in making a decision in combat.

—ADMIRAL ARLEIGH BURKE

The Board of Visitors

The duty of the Academy's Board of Visitors is to inquire into the state of morale and discipline, the curriculum, instruction, physical equipment, fiscal affairs, academic methods, and other matters relating to the Academy which the board decides to consider (Ex. Section 6968, Title 10, U.S. Code). The Board consists of six members appointed by the President, three appointed by the Vice President, four appointed by the Speaker of the House of Representatives, one designated by the Chairman of the Senate Armed Services Committee, and one designated by the Chairman of the House Armed Services Committee. The President of the United States receives an annual written report of the Board's findings and recommendations.

The 2001 Board of Visitors

Appointed by the President of the United States

Ms. Beverly Byron, Chairman

Vice Admiral Richard H. Truly, USN, (Ret.)

Dr. Judy J. Mohraz

Dr. Dolores Richard-Spikes

Ms. Ronnie Fern Liebowitz

Mr. Al From

Appointed by the Vice President

Senator Barbara A. Mikulski
Maryland

Senator Paul S. Sarbanes
Maryland

Senator Thad Cochran
Mississippi

Appointed by the Speaker of the House

Representative Joseph R. Skeen
Second District of New Mexico

Representative Wayne T. Gilchrest
First District of Maryland

Representative Steny H. Hoyer
Fifth District of Maryland

Representative John Tanner
Eighth District of Tennessee

Appointed by the Chairman of the Senate Armed Services Committee/ House Armed Services Committee

Senator John S. McCain
Arizona

Supporting Organizations

Several private, non-profit organizations support the Naval Academy in important ways. One of them is the Naval Academy Foundation, which awards scholarships to promising midshipmen candidates.

U.S. Naval Academy Alumni Association

The U.S. Naval Academy Alumni Association and the United States Naval Academy Foundation are non-profit, independent corporations with full-time professional staffs, under one President and governed by two separate boards. The Alumni Association has more than 40,000 members with nearly 100 percent of each class since 1980 registered as life members. The mission of the Alumni Association is to serve and support the United States, the Naval Service and the Naval Academy by furthering the highest standards at the Naval Academy; by seeking out, informing, encouraging and assisting outstanding, qualified young men and women to pursue careers as officers in the Navy and Marine Corps through the Academy; and by initiating and sponsoring activities which will perpetuate the history, traditions, memories and growth of the Academy and bind alumni together in support of the highest ideals of command, citizenship and government.

The United States Naval Academy Foundation is the single fundraising entity for the Naval Academy and the Alumni Association. The Foundation seeks gifts from individual and corporate donors in support of all facets of the development of the Brigade of Midshipmen and activities of the Alumni Association.

Since the first organized fundraising effort on behalf of the Academy by several alumni in 1848, millions of dollars in gifts from friends and alumni have assisted in the growth and development of the Academy. As the Naval Academy has grown in academic, physical, professional and athletic stature so has the need for private support. Federal appropriations continue to fund the Academy's core program components. But, in today's competitive world, private funds are absolutely essential to the strategic advancement of a dynamic learning environment that encourages midshipmen to anticipate and ultimately shape the new global century.

The Foundation provides the means and incentives for alumni, parents, and friends to contribute private funds that will ensure the highest levels of excellence in all areas of the Academy's mission and for which appropriated federal funds are not available, including athletic and scholarship programs. Many of the extraordinary facilities and programs at the Naval Academy were made possible through the generosity of alumni, parents, corporations and friends. In addition, since 1944, over 2800 candidates entered the Naval Academy through sponsorship from the Foundation's scholarship and preparatory program.

Although dramatic additions such as Alumni Hall, the W. H. FitzGerald Baseball Clubhouse, and the new Glen Warner Soccer Facility may be the most visible privately funded projects, the Brigade benefits from many other gifts as well. Just a few of these include:

- Internships providing opportunities for midshipmen to have direct exposure to the workings of our government system, fostering a better understanding of our collaboration with foreign governments.
- Support for the Naval Academy Career Information Program, which enhances the knowledge of midshipmen in the various military service communities.
- Support of the Voluntary Graduate Education Program that provides an opportunity for up to 20 First Class Midshipmen (Seniors) to study for a Masters Degree at local universities.
- Support for the Instructional Development Support Center that enables faculty and staff to develop multimedia products and other teaching tools for the classroom.
- Support of character development and related ethics programs for midshipmen.

In concert with the Foundation, the Alumni Association's primary focus is on "friendraising" and in promoting advocacy for the Naval Academy. The Alumni Association keeps its 40,000-plus members informed through over eighty chapters around the world via the Internet and its Web site, www.usna.com, while also providing necessary services to individual alumni through the chapters and classes.

Members of the Alumni Association are also active in assisting young men and women who are interested in attending the Naval Academy. Alumni Chapters all over the world sponsor events for candidates and their parents, working closely with Naval Academy Admissions personnel. Many alumni serve as Naval Academy Information (Blue and Gold) Officers.

All graduates and former midshipmen are eligible for regular membership in the Alumni Association, while any person who has demonstrated active support of the Naval Academy or the Alumni Association may be invited to apply for Associate Membership.



The best four years of my life were in the service. I had the opportunity to live in Japan with my wife and daughter, and I traveled all over the world with the Navy. The Naval Academy was the best place for me, with my abilities, athletic and academic.

—JOE BELLINO, CLASS OF '61,
1960 HUISMAN TROPHY WINNER

Naval Academy Athletic Association

The Naval Academy Athletic Association (NAAA) promotes and finances the Academy's intercollegiate athletic program, which is one of the largest athletic programs of any college or university in the United States. NAAA is responsible for the coaching, equipping, travel and lodging, promotion, ticketing and administrative support of all 30 varsity sports. NAAA also operates and maintains Navy-Marine Corps Memorial Stadium, a golf course and other athletic facilities for the Academy.

As another service, NAAA operates the Armel-Leftwich Visitor Center and Tour Guide Service. Any profits from these operations go to the Naval Academy's Memorial Fund, which supports special events and activities of the brigade. NAAA works actively with outstanding high school student-athletes who are interested in applying to the Naval Academy. NAAA coaches recruit young men and women according to the rules and regulations of the National Collegiate Athletic Association (NCAA).

Membership in NAAA is open to all Navy sports fans. NAAA's main offices are in Ricketts Hall, next to the Armel-Leftwich Visitor Center.

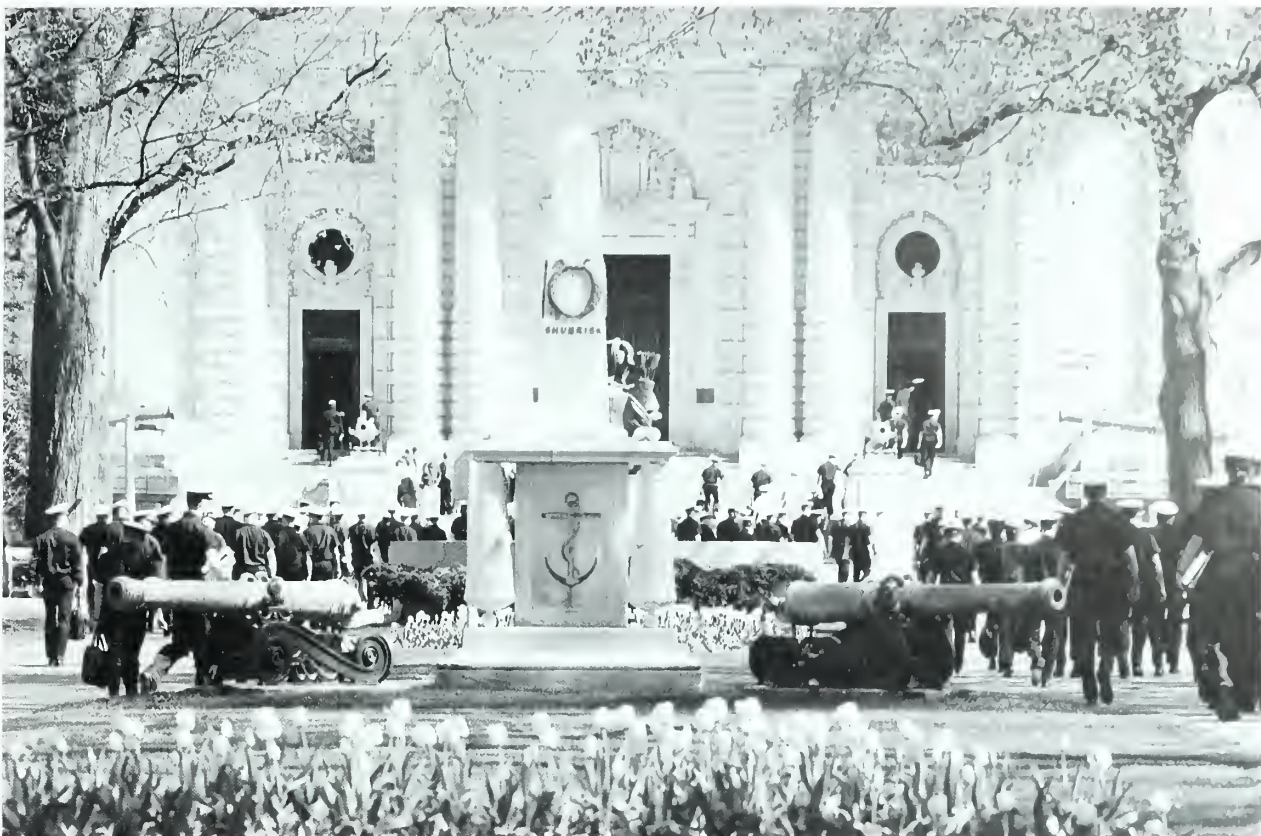
Naval Academy Sailing Foundation

The Naval Academy Sailing Foundation was organized in 1973 to support the Academy's sailing program. Through the foundation, yachts can be donated for use in midshipmen sail training and competition. Such donations also created an endowment that helps support the sailing program. The executive director of the foundation has an office in the Naval Academy's Robert Crown Sailing Center.

Naval Academy Museum

Located in Preble Hall, the Naval Academy Museum contains historic objects and works of art relating to some of the most important episodes in our nation's history. Its collection of more than 50,000 items includes ship models, paintings, prints, uniforms, medals, weapons, manuscripts and other evidence of famous naval officers, ships and nationally significant events. The exhibits in Preble Hall are open to the public seven days a week. The Museum maintains records on all the historic monuments in the Yard and the artifacts shown in the crypt of John Paul Jones, Memorial Hall and other academy buildings. Two new galleries in the Museum feature the outstanding Henry H. Rogers Collection of wooden ship models dating from the 17th century and numerous bone ship models. The Beverley R. Robinson Collection of Naval Prints provides more





The value of tradition to the social body is immense. The veneration for practices or for authority, consecrated by long acceptance, has a reserve of strength which cannot be obtained by any naval device.

—ALFRED THAYER MAHAN

than 6,000 images of ships and sea battles and is now available on CD-ROM, along with 15,000 additional pictures covering naval and Naval Academy history. The Museum contains weapons carried by Captains Stephen Decatur and Oliver Hazard Perry, Admiral David Farragut's plan for the Battle of Mobile Bay, Admiral George Dewey's uniform, the official class ring collection, the table used on the battleship Missouri to sign the surrender documents ending World War II in the Pacific, and flags carried to the moon by academy alumni. The Museum collection is a rich resource for study and research by midshipmen, faculty and visiting scholars.

U.S. Naval Institute

Founded in 1873, the U.S. Naval Institute has served for 125 years as the professional member society for the naval services, providing a forum in which Navy, Marine Corps, and Coast Guard professionals are free to discuss issues and concerns and their roles in maintaining America's strength. Headquartered on the grounds of the Naval Academy, the Naval Institute also serves as the Academy's university press, publishing texts in professional subjects, training guides and manuals, library works, scientific and technical studies in naval history.

Nearly 80,000 members receive the monthly *Proceedings* magazine, and can purchase Naval Institute Press books at reduced prices. In addition, Naval Institute members receive discounts on *Naval History* magazine, professional seminars, and other benefits.

The Naval Institute's bookstore is located in Preble Hall and is open to the public.

The Center for the Study of Professional Military Ethics

Authorized by the Secretary of the Navy in 1998, the Center has an ambitious mission—to promote and enhance the ethical development of current and future military leaders through education, research, and reflection. This mission charges the Center not only to work with and on behalf of the midshipmen, faculty, and staff the Naval Academy, but also to reach out to the Navy, the Marine Corps, the Department of Defense, and beyond. The strong outreach dimension of its mission makes the Center unique among its service academy counterparts, and its focus on military affairs, national defense, and international security makes it unique among ethics centers in academia.

The Center has three major program goals:

- 1.) To enrich the intellectual life of the Naval Academy in the field of ethics.
- 2.) To enhance the teaching of ethics in the military education and training systems, and beyond.
- 3.) To conduct executive and other outreach programs in ethics.

Its Naval Academy programs include:

- A lecture series, in which distinguished speakers address important issues in ethics;
- Faculty/staff ethics roundtables, in which a guest scholar or practitioner presents work in progress for informal but focused discussion by faculty and staff;
- A competition and prize for the outstanding ethics essays written in the Naval Academy's core ethics course;
- *Ethics for the Junior Officer*, a collection of case studies on ethical challenges facing Navy and Marine Corps junior officers, produced in conjunction with the Naval Academy Class of 1964 and presented to every member of the graduating class;
- Annual conferences on key topics in ethics;
- Faculty research sponsored by the Center and published as Center occasional papers, case studies, or monographs; and
- "Ethics at the Movies," which brings together small groups of Midshipmen for an informal evening of pizza, sodas, a movie, and a discussion of the ethical issues in the film.

In its first years of operation, four themes have emerged to guide the Center's future pursuit of its mission and program goals:

- To integrate ethics and leadership, because successful leadership in the fullest sense must be ethical leadership;
- To incorporate international perspectives and participants, to enrich its work and to prepare its participants for ethical decision-making in the international strategic environment;
- To make creative use of educational technology, to ensure a vibrant ethics program well into the twenty-first century; and
- To balance unilateral and collaborative projects, the first to establish the Center's identity and the second to expand its reach and effectiveness.

The Center's founders, sponsors, and leadership clearly intend for it to be "a beacon" for ethics, pointing the way for midshipmen, officers, enlisted personnel, civil servants, and others outside the Department of Defense, and shedding thoughtful and productive light on critical ethical challenges confronting the military, public service, the broader society, and ultimately the entire nation.



Appendix A: Medical Considerations for Admissions

Information is also available on our webpage: www.usna.edu/Admissions/medical.htm.

The Naval Academy program is physically challenging. All candidates are required to undergo a thorough medical examination because Academy graduates are commissioned in a wide variety of exciting career fields, most of which impose exacting medical standards.

The Department of Defense Medical Examination Review Board (DODMERB) will schedule your medical examination and review the report very carefully to determine if you meet our medical standards for admission. DODMERB will consider your medical history and information on illnesses, injuries, surgery, familial diseases, and other factors that could affect your medical status. You might be asked to submit additional reports and/or records from physicians or hospitals.

Approximately a month after your physical is completed you will receive (by mail) a status report of the DODMERB findings. If you have a disqualifying condition, the notification will advise you how to request a **waiver of the standard** by writing to the Admissions Board if you would like us to consider your application further. If your admissions record is competitive, and if the disqualifying condition is one for which a waiver might be possible, we will ask DODMERB to prepare your file for waiver consideration. You may have to provide amplifying information on the condition or undergo evaluation by a medical specialist. In most cases, we will seek independent review and an advisory recommendation from the staff of the Bureau of Medicine and Surgery in Washington, D.C., where all questions involving commissionability are resolved. Finally, the USNA Admissions Board will review your entire record. The Board will grant a waiver of the medical standard if your record suggests the risk introduced by the disqualifying condition is justified by your potential for success as a midshipman and as a naval officer.

Major medical considerations are summarized here so that you and your doctors can anticipate if you meet the basic requirements for admission to the Academy. This is not meant to be a comprehensive listing of all disqualifying conditions; it is a brief and general summary for your convenience.

Eyes and vision

This is the most common problem area for candidates. Our basic requirement for admission is normal (20/20) uncorrected visual acuity in each eye. The Admissions Board automatically considers waiver of the visual acuity standard for candidates who are otherwise medically qualified, who have exceptional scholastic and leadership potential, and who meet the following additional requirements:

- vision corrects to 20/20 in each eye with spectacle eyeglasses;
- spherical refractive error (the first of the three numbers in an eyeglass prescription) does not exceed ± 6.00 diopters in either eye;
- astigmatism (the second number in the prescription) does not exceed ± 3.00 diopters in either eye; and
- the difference in refractive error between the two eyes does not exceed 3.50 diopters.

However, for candidates unable to see 20/20 without glasses, admission is more highly competitive.

Abnormal color perception is disqualifying. Requests for waiver of the color vision standard are normally **not** considered. Color vision is also retested on Induction Day.

Keratoconus is disqualifying; a waiver **cannot** be approved.

Radial keratotomy (RK), photorefractive keratectomy (PRK), laser assisted in-situ keratomileusis (LASIK), epikeratophakia, orthokeratology, intra-corneal ring implants and all other surgical, laser, or mechanical procedures performed to correct visual acuity are disqualifying. In a departure from previous policy, we are now authorized to *consider* waivers of this disqualification for a limited number of candidates who have undergone corneal refractive surgery. RK is **strongly** discouraged and **unlikely** to be approved for waiver because it does not produce stable visual correction in operational environments. Comparing PRK and LASIK, PRK is favored because it has been studied/evaluated in the Navy's operational environments. Operational testing of LASIK is ongoing. We will continue to favor PRK until our operational experience with LASIK is more extensive. Waiver consideration for Naval Academy entry after corneal surgery is possible provided:

- the pre-procedure refractive error did not exceed +/-8.00 diopters in any meridian of either eye;
- spectacle correction to 20/20 is possible in each eye after the procedure;
- **at the time of the waiver request**, at least three months have elapsed since the most recent treatment;
- post-procedure refractive error is stable within 0.50 dipter as determined by two post operative refractions at least one month apart; and
- no disturbance of visual function (i.e. haze, glare, halos, etc.) is present.

The only form of refractive surgery **considered** for a waiver to enter Navy SEAL and naval aviation training is PRK. In general, it is prudent to delay all refractive surgery procedures until after the progression of nearsightedness associated with growth in eye size has ceased (beyond age 21 for many people). **If you are considering undergoing any refractive surgery or treatment, you are strongly encouraged to discuss this with the Senior Medical Officer in Admissions. Refractive surgery is disqualifying and the number of authorized waivers is extremely limited.**

If you wear glasses, take them with you to your examination. If you wear soft contact lenses, do not use them during the three days preceding your examination. Do not use hard or gas-permeable contact lenses for 21 days before your examination.

HEIGHT AND WEIGHT STANDARDS				
Height (inches)	Men		Women	
	MIN	MAX*	MIN	MAX*
60.....	—	—	92	142
61.....	—	—	95	145
62.....	103	152	97	149
63.....	104	157	100	152
64.....	105	162	103	156
65.....	106	167	106	160
66.....	109	172	108	163
67.....	111	177	111	167
68.....	115	182	114	170
69.....	119	188	117	174
70.....	123	192	119	177
71.....	127	196	122	181
72.....	131	201	125	185
73.....	135	206	128	188
74.....	139	211	130	192
75.....	143	216	133	195
76.....	147	221	136	199
77.....	151	226	139	203
78.....	153	231	141	206

* If your weight exceeds that shown for your height, you will be asked to provide measurements from which DODMERB will estimate body fat percentage.

Height and weight standards

The minimum qualifying height is 62 inches for men and 60 inches for women, and the maximum qualifying height for all candidates is 78 inches. Waivers may be granted by the Admissions Board to a limited number of exceptional candidates whose height exceeds this standard.

The minimum qualifying weight (by height) standards are listed in the table. Because of substantial variation in candidates' body composition, we apply an estimated body fat percentage when a candidate's weight exceeds the maximum listed. DODMERB will ask you to provide several measurements (if these were not recorded at the time of your initial physical examination) with clear instructions so you may ask your gym teacher (perhaps when you take your Physical Aptitude Examination), your Blue and Gold Officer, a coach, or your school nurse to provide the information.

In such cases, the qualifying standard is the body fat percentage: no more than 25 percent for men and 35 percent for women, as determined by our protocol. If your weight is at least the minimum and not more than the maximum shown for your height on the preceding table, you will **not** be asked to provide measurements for the body fat estimate.

Obesity will **not be waived**. If you exceed the body fat percentage standard on Induction Day, you should expect **not** to be allowed to enter the Academy.

Heart and vascular system

Among the disqualifying conditions are: uncorrected septal defect; congenital, rheumatic, or other abnormality of the heart valves or major vessels; abnormal heart rate or rhythm; blood pressure predominantly in the range of 140/90 or greater; severe or symptomatic varicose veins; and mitral valve prolapse which has either caused symptoms or been associated with rhythm disturbance or regurgitation.

Ears and hearing

Both ears must be free of tympanic membrane perforation and acute and chronic disease. The average of the hearing loss at 500, 1000 and 2000 Hz in either ear may not exceed 30 decibels (ISO), and the loss at any one of these three frequencies may not exceed 35 decibels. The maximum acceptable loss in either ear at 3000 Hz is 45 decibels and, at 4000 Hz, 55 decibels.

Respiratory system

A history of asthma, recurrent asthmatic bronchitis, exercise-induced bronchospasm, or reactive airway disease by any other name is disqualifying. Symptomatic nasal polyps, severe hay fever, and tuberculosis (if active within two years) will also result in disqualification. Nasal septal deviation, hypertrophic rhinitis, and other conditions that cause significant reduction of flow through either airway or which interfere with drainage of a sinus are disqualifying. Allergy immunotherapy, unless established at a monthly maintenance level and expected to be discontinued within two years of induction, is disqualifying.

Musculoskeletal system

Ununited fractures, history of surgery to a major joint within six months, history of derangement of any major joint not corrected by surgery or evidence of instability subsequent to surgery, history of anterior or posterior cruciate ligament injury, retained orthopaedic devices, arthritis, severe scoliosis, symptomatic structural abnormalities of the spinal column, and herniated nucleus pulposus or history of spinal surgery for this or any other condition are disqualifying.

Genitourinary system

Persistence of protein (except documented benign orthostatic proteinuria), sugar, or red or white blood cells in the urine is disqualifying, as are bedwetting continuing into adolescence and a history of recurrent or bilateral kidney stones. Severe congenital or developmental anomalies, hormonal disorders, neoplastic conditions, persistent or recurrent infections, and certain complications of infections are cause for rejection. An undescended testicle is disqualifying, as are pregnancy, endometriosis, and severe dysmenorrhea.

Gastrointestinal system

History of peptic ulcer, gall bladder disease, regional enteritis (Crohn's Disease), ulcerative colitis, or any other inflammatory bowel disease is disqualifying.

Neuropsychiatric disorders

Seizure disorders (but not uncomplicated febrile convulsions in childhood), degenerative conditions, vascular or other kinds of recurrent or severe headaches, and severe motion sickness susceptibility are disqualifying. History of psychosis or affective illness, personality disorder or immaturity, stammering, stuttering, eating disorders such as bulimia and anorexia, attention deficit or learning disorders/disabilities, hyperactivity, and sleepwalking persisting into adolescence also are disqualifying.

Skin

Chronic diseases such as psoriasis, atopic dermatitis, and eczema are cause for rejection. Severe acne is disqualifying until successfully treated. If a course of Accutane is undertaken, this should be completed, with documentation of a favorable outcome, prior to acceptance. Pilonidal sinus, if evidenced by a discharging mass, is cause for rejection until repaired successfully.

In consideration of current and anticipated Navy and Marine Corps policy regarding tattoos, branding, and body piercing, the Naval Academy has reaffirmed its policy which, in part, states:

“. . . Tattoos, brands and body piercing (other than a single perforation of each earlobe) are discouraged. No tattoo or brand may be visible when wearing any prescribed uniform, including regulation PE gear (gym clothes: in general, T-shirt sleeves covering half the upper arm and shorts covering half the thigh), or while representing USNA or the Naval Academy Preparatory School in athletic competitions. All tattoos or brands which are prejudicial to good order and discipline, offensive, or are of such a nature as to bring discredit upon the naval service are prohibited. Naval Academy Midshipmen and Naval Academy Preparatory School Midshipmen Candidates shall not get tattoos, body piercing, or brands.”

In support of this policy, DODMERB has been asked to note and describe all tattoos, brands, and body piercing (except as noted above). As a safeguard against oversight and to identify candidates who might have obtained a tattoo or other body marking after the DODMERB examination, candidates accepting an offer of appointment whose records have not been identified by DODMERB will be asked to state whether any of these conditions are present. In most cases this will not constitute a medical disqualification, but all candidates so identified will undergo independent review. Candidates with any skin marking which does not conform to our policy may be denied admission unless the condition can be corrected before induction or the candidate agrees to pursue correction aggressively at his or her own expense after reporting.

Other disqualifying conditions

Some other disqualifying conditions include:

- unrepaired abdominal wall hernia;
- removal of the spleen for most reasons except trauma;
- anemia;
- abnormal bleeding states;
- diabetes mellitus;
- sickle cell disease (sickle cell trait and glucose-6-phosphate dehydrogenase deficiency are not disqualifying);
- any active communicable infection;
- generalized reaction to stinging insect venom;
- family history of malignant hyperthermia;
- allergy to common foods requiring special dietary considerations;
- a history of drug abuse, alcohol abuse, or alcohol dependence;
- and exposure to the virus associated with AIDS (Acquired Immune Deficiency Syndrome).

A blood test for the presence of AIDS virus (HIV) antibodies, an alcohol breath test, and a urine test for drugs and pregnancy are performed on Induction Day at the Naval Academy; a confirmed positive result in any of these will lead to disqualification without possibility of a waiver.

Dental standards

Except for minor or questionable areas, you should have all required dental treatment completed before your medical examination. Missing teeth causing reduced masticatory (chewing) or incisal (biting) efficiency must be replaced by well-designed bridges, partial dentures, or implants in good condition. If you are undergoing active orthodontic treatment that will not be completed prior to your entry into the Naval Academy, you may request a waiver. Do not have braces removed before completion of treatment unless advised by the Naval Academy. Other disqualifying dental conditions include:

- infections or chronic diseases of the soft tissue of the oral cavity;
- marked malocclusion that requires early or prolonged treatment, involves tissue impingement on either the facial or lingual/palatal gingiva, or in some other way jeopardizes dental health;
- unsatisfactory restorations, bridges, dentures, or implants;
- severe or extensive apical or periodontal infection;
- perforations from the oral cavity into the nasal cavity or maxillary sinus; and
- tumors or cysts of the oral tissues that can be expected to require treatment in the foreseeable future.

Concluding comments

As you will realize from the foregoing summary, the physical examination for admission to the Naval Academy is comprehensive, and the medical and dental standards are specific and strict. This is necessary because our goal is for every midshipman to be able to anticipate unrestricted opportunities for commissioned service after graduation. For most candidates, the physical examination process will require no more than a single visit to the office of a physician, dentist, and an optometrist. For others, questions will arise that may necessitate a variety of additional evaluations. We know this can become time-consuming but we hope you will understand the reason for our concern. Questionable issues resolve favorably for the majority of candidates, and waiver of the standard(s) is often possible when documentation of a disqualifying condition in an individual candidate supports the expectation of unrestricted service. Staff members at DODMERB and in the admissions office will assist in every way possible.

Appendix B: Administration, Faculty and Staff

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Calendar for Candidates

Class of 2006

Refer to the steps in the Admissions Chapter.

April 1, 2001	Earliest date applications accepted.
January 31, 2002	Last date applications accepted.

2001

Spring	of junior year. Write your U.S. representative and both U.S. senators to request a nomination. Although many members of Congress will accept later requests, some into the early months of your senior year, others select their nominees much earlier. Write the vice president for a nomination (competitive) if you believe you are highly qualified for admission. Request a Pre-candidate Questionnaire from the Candidate Guidance Office by calling 1-810-293-1361 or from the "Request Information" link at the Internet address: www.usna.edu .
•March 31	SAT-I test. Register by February 23.
•April 7	ACT test. Register by March 2.
•May 5	SAT-I test. Register by March 29.
June 1	After submitting a Precandidate Questionnaire, prospective candidates will be scheduled for medical examinations at designated medical examining centers. Each candidate is individually notified by the Department of Defense Medical Examination Review Board (DODMERB) in Colorado.
*June 2	SAT-I test. Register by April 27.
*June 9	ACT test. Register by May 4.
July	Official candidates may expect to be contacted by a local representative of the Naval Academy Information (Blue and Gold Officer) Program.
July 1 - Jan. 31	If eligible (as explained in Admissions Section), write the Superintendent, United States Naval Academy (Attn: Nominations and Appointments Office) requesting presidential and/or other military service-connected nominations.
•September 22	ACT Test. Register by August 17.
*October 13	SAT-I test. Register by September 11.
*October 27	ACT test. Register by September 21.
Mid-October	Early offers of appointment are made to outstanding candidates. Offers continue into the following spring as admissions files on candidates are completed and additional well-qualified candidates are identified.
November 1	Deadline for receipt by the Vice President of requests for nominations.
*November 3	SAT-I test. Register by September 28.
*December 1	SAT-I test. Register by October 26.
*December 8	ACT test. Register by November 2.

2002

*January 26	SAT-I test. Register by December 21. Last SAT-I test utilized to evaluate class of 2006 admission.
*February 9	ACT test. Register by Jan. 4. Last ACT test utilized to evaluate class of 2006 admission.
March 1	Candidate files must be completed.
April 15	With few exceptions, all candidates will be notified on or before this date whether or not they have been accepted for entry.
July 1	Class of 2006 reports to the Naval Academy and takes oath of office as midshipmen.

** See your guidance counselor for exact date and for additional information on testing forms and registration deadlines or visit the test centers' official websites: www.sat.org or www.act.org.*

Note: Please request the applicable testing service(s) to forward the results of your examinations to the Naval Academy (SAT Code 5809, ACT Code 1742).

Tentative Calendar

2001-2002

2001

June 29	Class of 2005 enters.
August 10-12	Parents' Weekend, Class of 2005.
August 20	First semester begins.
September 3	Labor Day, holiday.
September 24-28	First marking period.
October 8	Columbus Day, holiday.
October 29-November 2	Second marking period.
November 12	Veterans' Day observed, holiday.
November 21-25	Thanksgiving leave period.
December 1	Brigade at Army-Navy game.
December 6-15	Examinations.
December 15-January 2	Christmas leave begins after last scheduled examination or military duty, whichever is later.

2002

January 7	Classes begin.
January 21	King's Birthday, holiday.
February 18	Presidents' Day, holiday.
February 11-15	First marking period.
March 8	Mid-term leave begins after last scheduled class or military duty, whichever is later.
March 17	Mid-term leave ends.
April 1-5	Second marking period.
April 30	Classes end.
May 1-10	Final examinations.
May 18-24	Commissioning Week begins.
May 24	Graduation
May 27	Memorial Day, holiday.
July 1	Class of 2006 enters.

This catalog should not be considered a contract between the United States Naval Academy and any prospective candidate. The curriculum, policies and dates are subject to change to meet varying requirements of the Navy.

Traveling to Annapolis

When traveling from the north on Interstate 95 South, exit on Interstate 69 East to Baltimore, then take Interstate 97 South exit. Follow Route 197 until it merges into Route 50 East.

From the south, Interstate 95 North, Maryland Route 2 North, and U.S. Route 30 North intersect Route 50. Travel east to Annapolis.

From Route 50, exit at Rowe Boulevard (south). Turn left at the end of Rowe Boulevard onto College Avenue. Turn right at King George Street, which will take you to Gate 1 of the Naval Academy.

Air

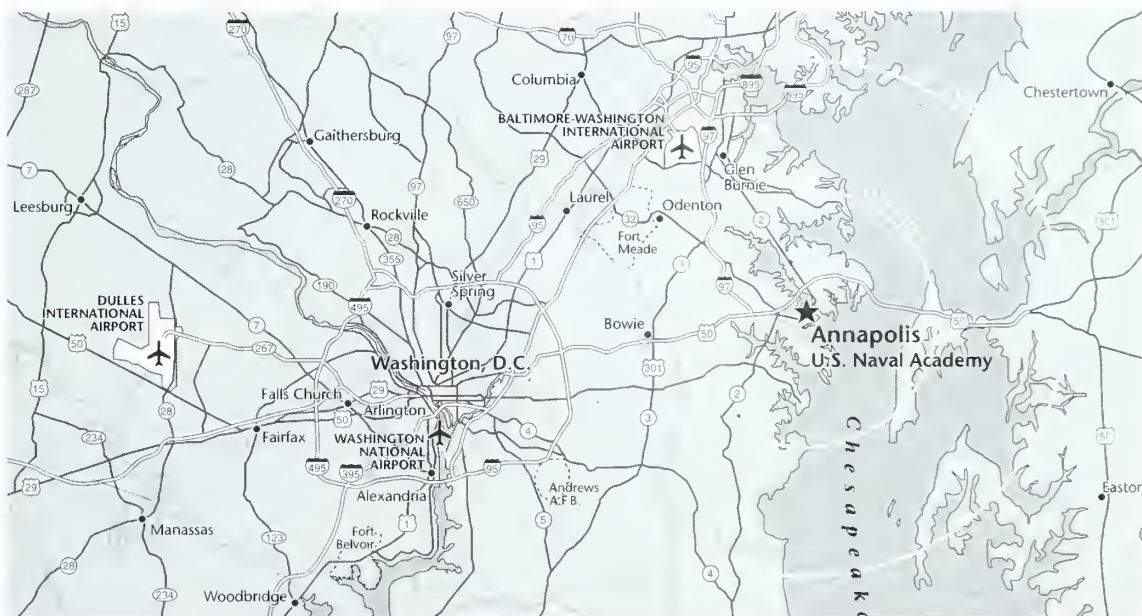
Baltimore-Washington International Airport (BWI) is convenient to Annapolis and serves most major airlines. A shuttle service runs regularly to the academy from BWI. Washington's National Airport and Virginia's Dulles International Airport are more than an hour's drive from Annapolis. Rental cars, taxicabs and limousine services are available at all three airports.

Rail

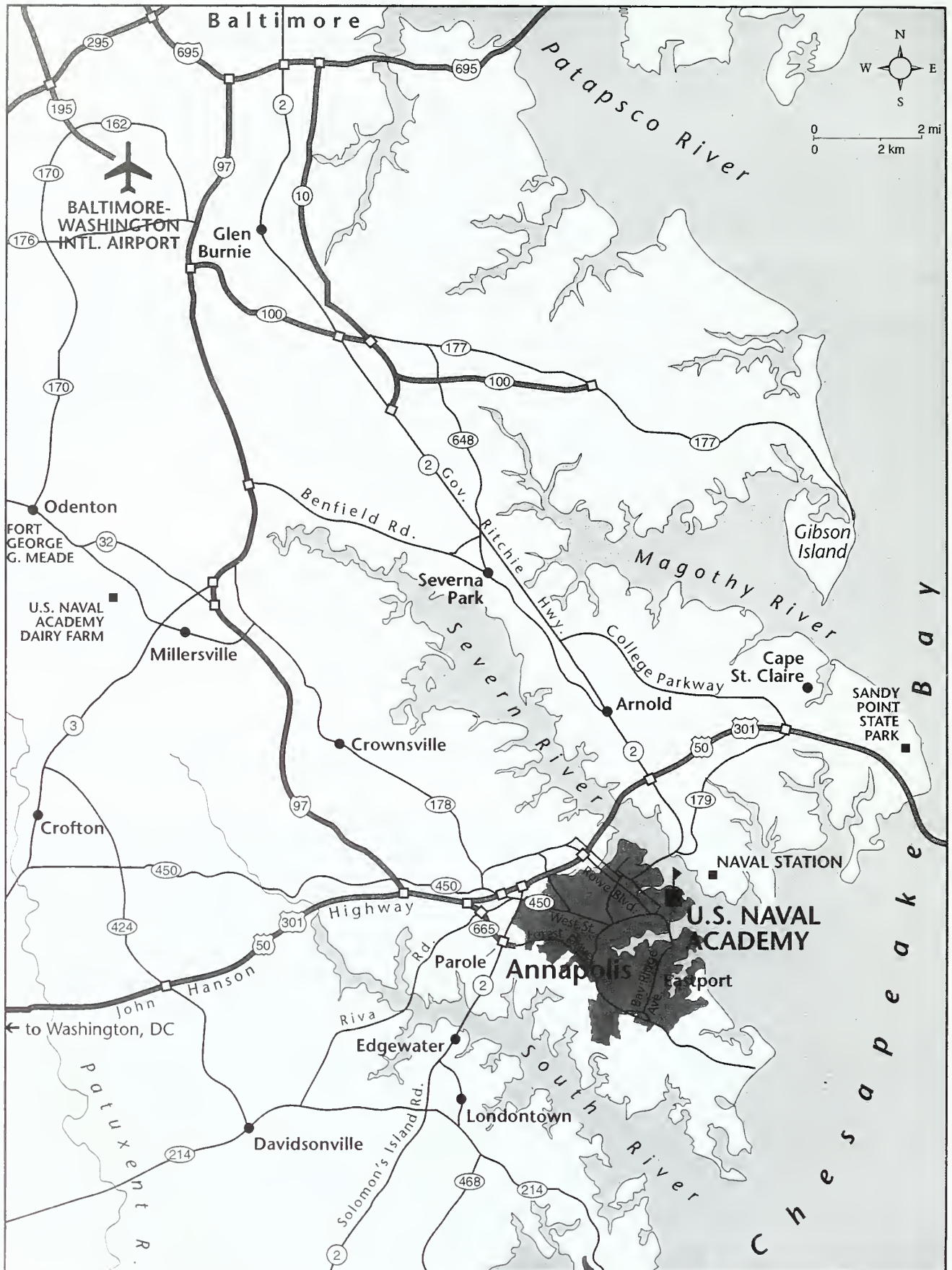
Amtrak serves Baltimore, Md., 30 miles away, New Carrollton, 17 miles away, and Washington, D.C., 33 miles from Annapolis. Taxi service is available from all rail terminals.

Bus

Greyhound/Trailways have terminals in Washington and Baltimore. Local buses run regularly from Baltimore, and Greyhound/Trailways schedule three buses daily from Washington.



ANNE ARUNDEL COUNTY • MARYLAND



United States Naval Academy Annapolis, Maryland

"THE YARD"





The Honor Treatise

As a Brigade we cherish the diverse backgrounds and talents of every midshipman yet recognize the common thread that unites us: the trust and confidence of the American people. They have appointed us to defend our country by developing our minds, our bodies, and most especially, our moral character.

It is our responsibility to develop a selfless sense of duty that demands excellence both of ourselves and of those with whom we serve. We must honor our loyalties without compromising our ultimate obligation to the truth. Our leadership must set a standard that reflects loyalty to our goals and the courage to stand accountable for all our actions, both those that lead to success and to those that end in failure. We will never settle for achieving merely what is expected of us but will strive for a standard of excellence that reflects the dedication and courage of those who have gone before us. When we attain our goal, we will raise our expectations; when we fall short, we will rise up and try again. In essence, we espouse leadership by example, a leadership that will inspire others to follow wherever we may lead.

Countless challenges and trials lie before us. We believe that those with the strongest moral foundation will be the leaders who best reflect the legacy of the Naval Academy. This is our call as midshipmen: it is a mission we proudly accept.

UNIVERSITY OF FLORIDA



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